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► To cite this version:

| Frederic B Jennings. The economic cultures of fear and love. 2023. hal-04380337v1

HAL Id: hal-04380337

<https://hal.science/hal-04380337v1>

Preprint submitted on 6 Jul 2023 (v1), last revised 2 May 2024 (v3)

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The economic cultures of fear and love

Frederic B. Jennings, Jr., Ph.D.

Abstract: In earlier work, the author has presented an economic case for complementarity as the dominant form of social relations. This paper considers the psychological impact of social systems based on substitution (conflicts of interest) vs. complementarity (concerts of interest). Here, reference is made to a psychological literature on negative vs. positive emotions and their health effects, along with neurological research showing humans hard-wired for empathy. The paper extends a horizontal case for complementarity into its psychological links on cognitive function and mental health. Substitution and complementarity yield opposite findings for competition and cooperation. The psychological and neurological literature reinforces a case for complementarity and cooperation, showing competition serves us ill and should be rejected for cooperation as a surer means to a mentally healthy society.

Keywords: substitution, complementarity, competition, cooperation, fear, love, physiological health, mental health

Introduction

In previous work, the author has explored the importance of complementarity in economics with regard to its origins in increasing returns as a case for revising institutional structure and social organization (Jennings 2017ab). Traditionally, economics has stressed substitution as a primary form of economic connection, as the basis for a static efficiency case for competition. Complementarity yields cooperation as efficient, where competition detracts from output just like collusion with substitution. ‘Horizon effects’ show competition is spawning a dangerously myopic culture, repressing output of intangibles such as information, bequeathing upon us costly ethical and ecological losses. This paper reviews the health implications of competition and cooperation in their social welfare effects.

Economics focuses on human well-being: how to organize social relations for the betterment of all through an efficient and equitable use of resources. But human well-being is psychological, raising questions on why economists treat competition as ideal while ignoring its human impact. Social relations involve a balance of substitution (negative feedback) and complementarity (positive feedback), capturing cultural tradeoffs of fear and love in human relations. Our institutional choices matter, resulting in how well we fare.

First, we must define the nature of economic connection. Does it embody opposition and conflicts, as substitution implies? If so, competition resolves such tradeoffs. But what if wants are linked in a reinforcing concert of interests that is complementary and not substitutional? Then cooperation – not competition – is efficient. Do we know which might be the case, or do wants encompass both at one time? As each has opposite structural implications, supposing just substitution ignores the importance of complementarity. We need to move beyond simple answers.

A horizontal economics supports a case for cooperation due to interhorizontal complementarity, as horizon effects are contagious. With that claim, concerts of interest show in learning and mental health. This case strengthens even more when neurophysiological and psychological issues combine to reinforce horizontal arguments for cooperation. This paper reports on new research in these fields and its significance for economics.

Two Forms of Interdependence

Assuming independence to justify partial analyses is not acceptable; nothing is ever really separate from anything else. In networks, social linkages have two forms: substitution and complementarity in nondecomposable tangles. Ecological economists follow ecology into interdependence, where all choices are intertwined and subject to vital limits on

nonrenewable natural assets. Georgescu-Roegen (1970, pp. 2-3) noted that: ‘actuality is a seamless whole’ with ‘no joints to guide a carver.’ Social interdependence is not just substitution; complementarity must be included.

The question turns on how wants are related. Is the interpersonal correlation of human desires positive or negative? Economists stress tradeoffs in production, demand and social relations, but a case can be made for complementarities in these settings (Nelson 1981, Jennings 2008). A network combines substitution and complementarity in a balance; systems theory uses the notion of feedbacks in the same way (Senge 1990, pp. 79-80). In transportation networks, parallel links and end-to-end ties show a similar pattern (Jennings 2006), where the distinction is purpose-specific, since one traveler’s tradeoffs are another’s serial routes. The point is, social relations coexist in a nondecomposable mix: we either drink beer or wine for a thirst, often with pretzels or cheese, but throwing a party includes them all. In complex economies, substitution and complementarity interrelate in a tenuous balance of interdependence.

All this suggests an institutional issue: substitution wants competition and complementarity calls for cooperation. If so, how should we organize social systems for maximum social well-being? Can we separate these issues and design institutions accordingly? If competition encourages substitutes while stifling complements, while cooperation does the reverse, can we find ‘seams’ where either applies, structuring systems accordingly? Or are such divisions too context- and purpose-specific to be analyzed thus? Without defining a general case, another tack is needed to resolve our organizational question. This is where planning horizons come in, as a means to settle the matter.

If we admit to a balance of substitution and complementarity in every economic context, the issue is how ‘horizon effects’ impact that balance. This has a general answer. With interhorizontal complementarity – namely, that private ‘horizon effects’[1] are socially contagious – this balance, with horizontal growth, tips away from substitution in favor of complementarity across social relations. As planning horizons extend, incentives align and social conflict dissolves since people include more of each other’s needs in designing their choices. In other words, longer/broader horizons internalize more of the externalities spilling from private decisions via an ethical increase of conscience (Jennings 2009a). Economic development shifts the composition of wants away from material goods to intangible outputs (Maslow 1954, 1968), showing another way that substitution evolves into complementarity as we grow and mature. Horizon effects structure social relations in all contexts.

This story yields a finding: competition is spawning a myopic culture by its stifling of intangibles such as learning, culture, community, love and information, while encouraging catastrophic ethical and ecological losses. The lesson of economic growth and development is this: social systems must adapt to this shift to complementarity by evolving away from competitive to more cooperative frames (Jennings 2009b). This is the context of what follows: the cultural and psychological impacts of competition vs. cooperation. Substitution assumes opposition, so we compete with each other to allocate goods to those who want them most.[2] Complementarity has wants aligned; fortunes shift together like a tide raising or dropping all boats. The cultural implications of these two systems could not be further apart.

Two Economic Cultures

A simplistic classification of these two cultures is based on ‘fear’ vs. ‘love’. Another contrast stands on their relative individualism. Peterson and Chang (2003, p. 69) compare Western and Eastern cultures on ‘flourishing’:

...Western cultures have been described as being individualistic. In such cultures, individuals are expected to seek independence from others by attending to the self. As a result, individuals from such cultures grow to develop a sense of the self largely independent of others. In cultures where the independent self is predominant, we find a self-enhancing bias involving overly positive views of the self, illusions of control, and unrealistic optimism.

In contrast, the focus in Eastern cultures traditionally has been on a view of the individual who maintains a fundamental relatedness with others. Attending to others, harmonious interdependence with them, and fitting in not only are valued but are often expected, which results in an interdependent view of the self.

So one way to define cultures is along this spectrum between individualism and inclusiveness. U.S. self-orientation is contrasted with Eastern 'harmonious interdependence.' What if systems adapt to our assumptions, so reinforce such behavior? Senge (1990, p. 274, quoting Badaracco and Ellsworth 1989) notes the 'self-fulfilling' character of the belief 'that people are motivated by self-interest and by ... power and wealth':

If people are assumed to be motivated only by self-interest, then an organization automatically develops a highly political style, with the result that people must continually look out for their self-interest in order to survive. An alternative assumption is that, over and above self-interest, people truly want to be part of something larger than themselves. ... When organizations foster shared visions, they draw forth this broader commitment and concern.

If our selfishness is symptomatic of short horizons in a myopic culture, accepting this behavior as 'natural' is part of the problem, as some management theorists suggest (cf. Argyris 1971, pp. 262-63, 268-69; Maslow 1954, 1968; Wachtel 1989; Kohn 1986; Scitovsky 1976). Argyris said, when leaders treat members like children, mature individuals show pathological symptoms of ill mental health, such as 'frustration, failure, short time perspective and conflict.' He voiced concern for fragmentation: 'The nature of the formal principles of organization causes the subordinates, at any given level, to experience competition, rivalry, intersubordinate hostility and to develop a focus toward the parts rather than the whole.' McGregor (1971, pp. 310-11) warned that:

The deprivation of needs has behavioral consequences. ... The man whose needs for safety, association, independence or status are thwarted is sick, just as surely as he who has rickets. We will be mistaken if we attribute ... passivity, or ... hostility, or ... refusal to accept responsibility to ... inherent 'human nature.' These forms of behavior are symptoms of illness – of deprivation of ... social and egoistic needs.

McGregor then extended the connection to consumers' materialism:

...the fact that management has provided for these physiological and safety needs has shifted the motivational emphasis to the social and egoistic needs. Unless there are opportunities at work to satisfy these higher-level needs, people will be deprived; and their behavior will reflect this deprivation. ... People will make insistent demands for more money under these conditions. It becomes more important than ever to buy the material goods and services which can provide limited satisfaction of the thwarted needs. Although money has only limited value in satisfying many higher-level needs, it can become the focus of interest if it is the only means available.

The point is, some manifestations of selfishness and short-sightedness may be pathological symptoms of improper designs, of competitive failure in complementary settings. This is how horizons impact economics. Cultures are also horizontal, as implied in the previous quotes. A focus on competition and cooperation will help to frame these connections; 'fear' and 'love' can define these systems' psychological impacts, subject to one quick qualification.

First, fear does not always rule in competition, any more than love frames cooperation. Every case is different; people deal with their situations in diverse ways. This simplistic categorization of 'fear' and 'love' to compare cultures serves as an easy way to characterize their difference. Having posed that disclaimer, the social implication of substitution is that others are seen in opposition, so competition entails rivalries. Here everyone needs to protect themselves against the incursion of enemies. Kohn (1986, pp. 55, 61-65, 108, 110, 113, 123, 129-31 and 143) described the psychological impact of competition on healthy human development thus:

The simplest way to understand why competition generally does not promote excellence is to realize that trying to do well and trying to beat others are two different things. ... Competition ... precludes the more efficient use of resources that cooperation allows. ... Beyond the greater efficiency of cooperation, it is also true that competition's unpleasantness diminishes performance. ... At best, the stressfulness of a competitive situation

causes us to try to avoid failure. And trying to avoid failure is not at all the same thing as trying to succeed. ...Competition does not promote excellence. ... Whereas cooperation apparently contributes to high self-esteem, competition often seems to have the opposite effect. ... Psychological health requires unconditionality... In competition, by contrast, self-esteem is conditional. ...Something very like an addiction is at work here...: the more we compete, the more we need to compete. ... In sum, the security that is so vital to healthy human development is precisely what competition inhibits. ...Competition does not promote ... substantial and authentic ... individualism. On the contrary, it encourages rank conformity [and] ... dampens creativity. ... Creativity is anticonformist at its core; it is ... a process of idiosyncratic thinking and risk-taking. Competition inhibits this process ... [and] affects the personality. Turning life into a series of contests turns us into cautious, obedient people. ... The chief result of competition ... is strife.

This is one view of how an individualistic culture of fear, stress and strife fares for individuals. We see our rivals as opponents, each against the other, so it is in our collective interest to compete with each other. This is what many economists claim. Kohn casts doubt on this view. Argyris said the psychological impact of treating adults like kids include 'short time perspective and conflict.' These are the social horizon effects of a myopic culture that we tend to accept. McGregor (1971, p. 317) remarked: 'Fish discover water last.' What of complementarity?

With others' needs in line with one's own, the social scene transforms. If your well-being contributes to mine, I help you for my own good; indeed, there is no distance between my needs and yours! This is what Nelson (1981, pp. 1053-55) said, translated to human relations: 'If factors are complements, growth is superadditive... The growth of one input augments the marginal contribution of others.' Here: 'there are not neatly separable sources of growth, but rather a package of elements all of which need to be there.' Cooperation actuates complementarities so we flourish together. We cannot distinguish anyone's needs from another's; they rise and fall in concert through teamwork.

In this situation, bountiful collaboration is bounded by competition! Selfish predation and opportunism will make cooperation impossible; everyone needs to be on the team to work in concert together. Otherwise, our performance suffers. Our habited individualism puts cooperative fruits out of reach. This is a loss in competitive cultures and in what they teach; selfishness precludes successful organization of complementarities. We never see what we miss.

We have two economic cultures, characterized by 'fear' and 'love.' One arises from conflict; it leads to a culture of fear reflected in stress and strife. The other revolves around common needs, if team members can set aside personal needs enough to work for all in a spirit of care and compassion. We are all prisoners of this dilemma; entailing much social malaise (Jennings 1983). New research in neuropsychology reinforces such concerns.

Human Well-Being and Functionality

Economics is about decisions, the making of which involves selective projection of outcomes through a causal understanding by uncertain minds. The process is speculative: 'If I kick the world like this instead of that, the result will be this, not that.' What are the goals of our actions? They usually are to reduce negative and to promote positive feelings (hopefully not just for ourselves). We opt for 'well-being', not always successfully due to slips between cup and lip. We also live in a social world of others' reactions. Norris and Cacioppo (2007, p. 87) said:

...human beings are fundamentally social creatures. And ... emotions may have evolved to promote cooperation and communication in a social group... Social information is highly valued and critical for survival throughout the lifespan, as it contributes to successful attachment, reproduction, vigilance toward threatening encounters, and protection of territory and significant others. From birth, we engage in behaviors intended to ensure affiliation with other members of the species, especially caregivers.

We choose in a situational context, apply a causal model to understand its spreading extensions, project outcomes of our options, evaluate them, making decisions based on their likelihood and value. The goal's emotional impact is seen as positive (for affinity) or negative (for retreat) to inform our best course of action.

The Roots of Human Empathic Connection

How do we know what others will do, reacting to our decisions, or how they might think or act on their own? All shapes our results, based on prior expectations, calling for an empathetic connection to others that is not just a given. If all choice is a normative process of multidimensional causal projection, then each includes others. As Norris and Cacioppo (2007, p. 93) explain, 'it can be dangerous not to read correctly the motives and intentions of others. ... Accurate evaluation of the motives of others and decryption of their current emotional states are skills necessary for navigating our social world.'

Recent findings in neuroscience shed light on how we develop empathic capacity; mirror neurons show 'a common neurobiologic dynamic for our understanding of others' in which 'we mentally rehearse or imitate every action we observe ... mirror neurons help us share others' experience as reflected in their expressions, providing a biological basis for empathy and for the well-known contagiousness of yawns, laughter, and good or bad moods' (Dobbs 2006, pp. 1-2). 'This model posits that perception of emotion activates in the observer the neural mechanisms ... responsible for the generation of similar emotion. Such a system prompts the observer to resonate with the emotional state of another individual...' (Decety 2007, p. 252). As Gallese (2004, pp. 4-5) put it:

Successful perception requires the capacity of predicting upcoming sensory events. Similarly, successful action requires the capacity of predicting the expected consequences of action. As suggested by an impressive and coherent amount of neuroscientific data, both types of predictions seem to depend on the results of unconscious and automatically driven neural states, functionally describable as simulation processes. ... Such body-related experiential knowledge enables us to directly understand some of the actions performed by others, and to decode the emotions and sensations they experience. Our seemingly effortless capacity to conceive of the acting bodies inhabiting our social world as goal-oriented persons like us depends on the constitution of a "we-centric" shared meaningful interpersonal space. ... Intentional attunement, ... by collapsing the others' intentions into the observer's ones, produces the peculiar quality of familiarity we entertain with other individuals. This is what "being empathic" is about. By means of a shared neural state ... the "objectual other" becomes "another self."

This empathic process is neither direct, automatic or simple. Mirror neurons, explains Iacoboni (2007, p. 447), 'do not simply provide an action-recognition mechanism but rather represent a neural system for coding the intentions of other people' that 'seems to reflect a more holistic stance toward contexts, actions and intentions.' Norris and Cacioppo (2007, p. 96) elaborate on this insight thus:

One example of the effects of social context on emotion is that of empathy, in which the emotional meaning of an event is completely dependent on the social context in which the experienced emotion mirrors that of a conspecific. By definition, empathy cannot occur in the absence of a social context. Recent research on the neural mechanisms underlying empathy suggests that empathic responses are accompanied by, if not generated through, imitation of facial expressions. ... A recent study suggests that empathy does not rely merely on mirror neurons and activation of motor networks or imitation of emotional expression but may have also co-opted other neural structures involved in emotional processing. ... Thus the experience of empathic pain for a loved one may have co-opted the existing pain network... Empathy, however, is not always the adaptive response to a conspecific's emotion display; motives, intentions, and context must be taken into consideration to generate an appropriate response. ... Thankfully, we are not dependent on blind faith attributions of the motivations that drive fellow human beings; rather, we are able to reason and make inferences about others' mental states. Such inferences constitute additional contextual (and social) influences on emotional experience.

The Relation of Social Connection to Physiological and Mental Health

These social connections are linked to physiological and mental health. As Carter (2007, pp. 425, 434) notes:

...the major challenge for science in the 21st century is developing an understanding of the processes and mechanisms responsible for health. It is increasingly clear that health is not simply the absence of illness but that it includes active processes, maintained in part by social interactions and social bonds. ... The benefits of social support and social bonds have been described in epidemiological studies. Perceived social support is often negatively correlated with various illnesses, ranging from mental illness to heart disease and cancer. ...

Of special relevance to human health is the capacity of a perceived sense of social support or the presence of social bonds to reduce fear ... in the face of stress. Reductions in social behavior and stress management are features of many forms of mental illness, including autism, depression, and schizophrenia. Episodes of certain mental illness ... may be induced or at least exacerbated by social stressors, especially in the absence of social bonds.

Taylor and Gonzaga (2007, pp. 466-67) find it 'intriguing' that 'the affiliative system ... continues to have such powerful effects on health and survival ... through social support and social integration...' They continue:

Research consistently shows that social support reduces psychological distress, such as depression or anxiety, and promotes psychological adjustment to a broad array of stressful conditions. ... In both animal and human studies, social isolation is tied to a significantly enhanced risk of mortality and a heightened risk of both chronic and acute health disorders. Although not all the mechanisms that explain these strong relationships are known, one key pathway is via stress responses. ... People without social support systems, for example, are more vulnerable to infectious disorders. Correspondingly, the positive impact of social ties on health outcomes is as powerful as or more powerful than established (negative) risk factors for diseases, including lipid levels and smoking.

Norris and Cacioppo (2007, p. 88) also underline the role of social affinity in human health and functionality:

Healthy social relationships continue to be important for emotional and physical well-being throughout the life-span, as evidenced by research demonstrating that social isolation is a major risk factor for morbidity and mortality and that loneliness, an emotional response to broken or inadequate social connections, is related to cardiovascular function and sleep quality. ...Lonely individuals report ... higher negative affect and lower positive affect... ...Loneliness has a pervasive influence on everyday affective experience and quality of social interactions and, importantly, that these two outcome factors have reciprocal effects on each other. In other words, both the chronic perception of one's social belongingness (i.e., loneliness – social connectedness) and fluctuations in the quality of social interactions appear to have effects on one's daily emotional life. In addition, loneliness relates to cardiovascular functioning and stress appraisals, such that lonely individuals exhibit greater total peripheral resistance (TPR) and lower cardiac output (CO) than their socially embedded counterparts. Thus daily social interactions have consequences not only for emotional experience but also for cardiovascular functioning and health.

Cacioppo, Petty and Tassinari (1989, p. 83) add: '...The leading causes of disability and death in Western civilizations have substantial social and behavioral components...' Uchino et al. (2007, pp. 474-75) elaborate:

Social processes are among the more powerful psychological predictors of physical health outcomes. As predictors or mechanisms, social events appear to play important roles in both the development and exacerbation of physical health conditions. For instance, social support, besides being a consistent epidemiological predictor of mortality in itself, is purported to be an important pathway in other risk factors, such as socioeconomic status and personality processes. ... It is our view that a social neuroscience perspective is critical to understanding the links between social ties and health outcomes.

After reviewing the harmful cardiovascular effects of social stress, Uchino et al. (2007, p. 480) discuss...

...the large body of epidemiological studies suggesting that both the quantity and quality of one's relationships predicts lower all-cause mortality. The links between social relationships and health are most evident for cardiovascular mortality, with some studies showing links with lower cancer and HIV mortality.

The Impact of a Stressful Society on Human Health

There has been a great deal of research on the health effects of stress; Kudielka et al. (2007, pp. 56-57) explain that: 'The World Health Organization (WHO) concluded that stress is one of the most significant health problems in the 21st century. ...Stress responses appear to be a close correlate or even a determining factor of the onset of different diseases or disease progression...' Judith Friedman (2023) looks at the impact of stress on the brain:

Stress is an everyday occurrence and a normal part of life and can positively or negatively affect the brain. However, chronic stress can lead to changes in the brain that can contribute to mental health disorders. The stress response is controlled by the hypothalamic-pituitary-adrenal (HPA) axis, which releases cortisol and other stress hormones. High cortisol levels can damage the hippocampus, leading to memory problems and cognitive deficits. Stress can also cause changes in the prefrontal cortex, which is in charge of decision-making and impulse control. Chronic stress can decrease the prefrontal cortex's size, which can contribute to mood disorders such as depression and anxiety.

Taylor and Gonzaga (2007, pp. 456-57) add that, beyond its long-term harm to health, stress can have short-term survival benefits in 'fight or flight' situations...

...because [these responses] mobilize the body to meet the demands of pressing situations and then prime homeostatic mechanisms that restore the body to its previous functioning. With repeated or recurrent stress, however, biological stress responses can have long-term costs that have implications for health... [including] suppression of cellular immune function ... chronic increases in blood pressure ... abnormal heart rhythms ... immunosuppressive effects ... increased susceptibility to infectious disorders ... hypertension, cardiovascular disease, and insulin resistance, enhancing risk for diabetes, among other disorders.

They raise questions about these responses, since 'fighting or fleeing may not be humans' best defense against predators.' They offer another strategy that they call 'tend' and 'befriend': 'Coming together as a group, instead of fleeing and fighting on one's own, would provide more hands for defense and perhaps confuse or intimidate a predator. ... In short, there are good reasons to think humans have evolved to use social relationships as a primary resource to deal with stressful circumstances.' Indeed, as they put it:

From animal studies and our own data, we infer that there is an affiliative neurocircuitry that prompts affiliation, especially in response to stress, in many animal species, and especially in humans. ... That is, just as people have basic needs, such as hunger, thirst, sexual drives, and other appetites, they also need to maintain an adequate level of protective and rewarding social relationships.

Just as occurs for these other appetites, we suggest that there is a biological signaling system that comes into play if one's affiliations fall below an adequate level. Once signaled, the appetitive need is met through purposeful social behavior, such as affiliation. If social contacts are hostile or unsupportive, then psychological and biological stress responses are heightened. If social contacts are supportive and comforting, stress responses decline. Positive contacts then lead to a decline in need and, in the context of stress, a decline in stress responses.

They conclude that: 'A picture of the emerging regulatory role of affiliation in response to stress and its biological underpinnings is coming into view' (Taylor and Gonzaga 2007, p. 469).

The Health Effects of Emotion

General Effects. Emotional states have important health effects. 'Aristotle was among the first to suggest the connection of mood to health: "Soul and body, I suggest, react sympathetically upon each other," he is credited with

saying.' Pert (1997, pp. 190-93) goes on: 'Howard Hall ... in 1990 ... was the first to show that psychological factors [and...] conscious intervention could directly affect cellular function in the immune system. ...

If the immune system can be altered by conscious intervention, what does this mean for the treatment of major diseases such as cancer? ... Lydia Temoshok, a psychologist then at UCSF, showed that cancer patients who kept emotions such as anger under the surface, remaining ignorant of their existence, had slower recovery rates than those who were more expressive. Another trait common to these patients was self-denial, stemming from an unawareness of their own basic emotional needs. The immune systems were stronger and tumors smaller for those in touch with their emotions.

Can suppressed anger or other "negative" emotions cause cancer? ... Let me begin to answer by saying that I believe all emotions are healthy, because emotions are what unite the mind and the body. ... To repress these emotions and not let them flow freely is to set up a dis-integrity in the system, causing it to act at cross-purposes rather than as a unified whole. The stress this creates ... is what sets up the weakened conditions that can lead to disease. All honest emotions are positive emotions.

Heart Rhythms. Some interesting insights from HeartMath on the heart's role in healthy physiological function show why, according to McCraty, Bradley and Tomasino (2004/5, pp. 15-19), 'the heart is now recognized by scientists as a highly complex system with its own functional 'brain.' ...

... The nervous system within the heart (or 'heart brain') enables it to learn, remember, and make functional decisions independent of the brain's cerebral cortex. Moreover, numerous experiments have demonstrated that the signals the heart continuously sends to the brain influence the function of higher brain centers involved in perception, cognition, and emotional processing. ... The heart also communicates information to the brain and throughout the body via electromagnetic field interactions. ... We propose that the heart's field acts as a carrier wave for information that provides a global synchronizing signal for the entire body. ... The rhythmic beating patterns of the heart change significantly as we experience different emotions. Negative emotions, such as anger or frustration, are associated with an erratic, disordered, incoherent pattern in the heart's rhythms. In contrast, positive emotions, such as love or appreciation, are associated with a smooth, ordered, coherent pattern in the heart's rhythmic activity. ...

More specifically, we have demonstrated that sustained positive emotions appear to give rise to a distinct mode of functioning, which we call psychophysiological coherence. During this mode, heart rhythms exhibit a sine wave-like pattern and the heart's electromagnetic field becomes correspondingly more organized.

- *At the physiological level, this mode is characterized by increased efficiency and harmony in the activity and interactions of the body's systems.*
- *Psychologically, this mode is linked with a notable reduction in internal mental dialogue, reduced perceptions of stress, increased emotional balance, and enhanced mental clarity, intuitive discernment, and cognitive performance.*

In sum, our research suggests that psychophysiological coherence is important in enhancing consciousness – both for the body's sensory awareness of the information required to execute and coordinate physiological function, and also to optimize emotional stability, mental function, and intentional action. Furthermore ... there is experimental evidence that psychophysiological coherence may increase our awareness of and sensitivity to others around us. ...

Another commonality is the role of positive emotions, such as love and appreciation, in generating coherence both in the heart field and in social fields. ... Heart coherence and social coherence may also act to mutually reinforce each other. As individuals within a group increase psychophysiological coherence, psychosocial attunement may be increased, thereby increasing the coherence of social relations. Similarly, the creation of a coherent social field

by a group may help support the generation and maintenance of psychophysiological coherence in its individual members. An expanded, deepened awareness and consciousness results – of the body's internal physiological, emotional, and mental processes, and also of the deeper, latent orders enfolded into the energy fields that surround us. This is the basis of self-awareness, social sensitivity, creativity, intuition, spiritual insight, and understanding of ourselves and all that we are connected to.

In furthering a horizontal case for cooperation, Tomasino (2007, pp. 530-31) summarized the Heartmath research:

In short, positive emotions appear to broaden the scope of perception, cognition, and behavior and to enhance creative and intuitive capacities. Conversely, negative emotions tend to restrict perception, produce more reactive, rigid, and stereotypic patterns of thought and action, and have been found to be associated with reduced task performance and impaired intuitive judgments. ... In general, emotional stress and negative emotions such as anger, frustration, and anxiety lead to heart rhythm patterns that appear incoherent – irregular and erratic. ... In contrast, sustained positive emotions, such as appreciation, care, compassion, and love, generate a smooth, sine-wave-like pattern in the heart's rhythms.

Fear and Love. Stress interferes with physiological functionality at all levels. Arguelles, McCraty and Rees (2003, pp. 15-16, 20) elaborate on some of the harmful effects of stress, which...

...causes our system to get 'out of sync' – not only mentally and emotionally, but also physiologically. ... The result is emotional incoherence, increased energy drain, and added wear and tear on the body. ... During emotional stress, when the heart transmits a disordered signal to the brain and activity in the nervous system is chaotic or desynchronized, higher cognitive functions are inhibited – limiting our ability to think clearly, focus, remember, learn, and reason.

The effects of positive feelings are quite the reverse, improving mental and bodily functions in diverse ways:

In contrast, sustained positive emotions, such as appreciation, love, and compassion, are associated with highly ordered or coherent patterns in the heart rhythms, reflecting greater synchronization between the two branches of the autonomic nervous system and increased physiological efficiency. Thus, sincerely experiencing positive feelings helps us get (and stay) 'in sync' ... often resulting in enhanced focus, memory recall, comprehension, and creativity. ... Positive emotion-focused, coherence-building tools are effective in helping to stabilize nervous system dynamics in real time...

They conclude with the hope that:

A new consciousness about the heart may have profound implications not only for the transference of information and knowledge in our learning systems but for the cultivation of those aspects of human experience that are associated with wholeness: caring, giving, appreciation, nurturing, and love.

Positive Feelings and Human Performance

Positive feelings have beneficial health effects; they 'have been demonstrated to improve health and increase longevity, increase cognitive flexibility and creativity, facilitate 'broad-minded coping' and innovative problem solving, and promote helpfulness, generosity and effective cooperation' (Childre and McCraty 2001, p. 13). Seligman and Csikszentmihalyi (2000, p. 5), adherents of 'positive psychology,' describe their approach thus:

The field of positive psychology at the subjective level is about valued subjective experiences: well-being, contentment, and satisfaction (in the past); hope and optimism (for the future); and flow and happiness (in the present). At the individual level, it is about positive individual traits: the capacity for love and vocation, courage, interpersonal skill, aesthetic sensibility, perseverance, forgiveness, originality, future mindedness, spirituality, high talent, and wisdom. At the group level, it is about the civic virtues and the institutions that move

individuals toward better citizenship: responsibility, nurturance, altruism, civility, moderation, tolerance, and work ethic.

Seligman and Csikszentmihalyi (2000, p. 7) add that researchers find these positive traits 'act as buffers against mental illness' calling 'in this new century' for a 'science of human strength.' Duckworth, Steen and Seligman (2005, pp. 629, 635-36) explain that: 'Our proposed conceptual framework parses happiness into three domains...

*The first domain, **the pleasant life**, concerns positive emotion about the past, present, and future. ... The second domain is **the engaged life**, which consists of using positive individual traits, including strengths of character and talents. ... The third domain of positive psychology is **the meaningful life**, which entails belonging to and serving positive institutions. ... Positive psychology asks, "What are the institutions that enable the best in human nature?" An incomplete list of institutions that can cultivate positive emotion and positive traits includes mentoring, strong families and communities, democracy, and a free press. We believe that positive traits and positive emotions flourish best in the context of positive institutions. Because meaning derives from belonging to and serving something larger than oneself, a life led in the service of positive institutions is the meaningful life.*

Frederickson and Losada (2005, pp. 678-79) frame these issues in terms of 'flourishing' vs. 'languishing': 'To flourish means to live within an optimal range of human functioning, one that connotes goodness, generativity, growth, and resilience. ... Epidemiological work suggests that fewer than 20% of U.S. adults flourish and that the costs of languishing are high; ...languishing brings more emotional distress, psychosocial impairment, limitations in daily activities, and lost work days.' They explain that 'a key predictor of flourishing is the ratio of positive to negative affect. ...

A wide spectrum of empirical evidence documents the adaptive value of positive affect... Beyond their pleasant subjective feel, positive emotions, positive moods, and positive sentiments carry multiple, interrelated benefits. First, these good feelings alter people's mindsets: Experiments have shown that induced positive affect widens the scope of attention, broadens behavioral repertoires, and increases intuition and creativity. Second, good feelings alter people's bodily systems: experiments have shown that induced positive affect speeds recovery from the cardiovascular aftereffects of negative affect, alters frontal brain asymmetry, and increases immune function. Third, good feelings predict salubrious mental and physical health outcomes: Prospective studies have shown that frequent positive affect predicts (a) resilience to adversity, (b) increased happiness, (c) psychological growth, (d) lower levels of cortisol, (e) reduced inflammatory responses to stress, (f) reductions in subsequent-day physical pain, (g) resistance to rhinoviruses, and (h) reductions in stroke. And fourth, perhaps reflecting these effects in combination, good feelings predict how long people live: Several well-controlled longitudinal studies document a clear link between frequent positive affect and longevity.

Horizon Effects and Broadened Perspectives

These authors do not refer to 'planning horizons' in tracing their 'broaden-and-build theory' of positive feelings, but their discussion is so rife with horizontal issues of broadening human perspective, flexibility, openmindedness and general learning effects that the meaning comes clear. Planning horizons supply an organizing principle for this work, while 'horizon effects' show their relevance to economic behavior. Frederickson and Losada (2005, pp. 679) explain the implications of their theory:

The theory holds that unlike negative emotions, which narrow people's behavioral urges toward specific actions that were life-preserving for human ancestors (e.g., fight, flight), positive emotions widen the array of thoughts and actions called forth (e.g., play, explore), facilitating generativity and behavioral flexibility. Laboratory experiments support these claims, showing that relative to neutral states, induced negative emotions narrow people's momentary thought-action repertoires, whereas induced positive emotions broaden these same repertoires.

The entire process is wholly horizontal in its expansion/retraction of the range of human awareness and choice:

The theory holds that in contrast with the benefits of negative emotions – which are direct and immediately adaptive in life-threatening situations – the benefits of broadened thought-action repertoires emerge over time. Specifically, broadened mindsets carry indirect and long-term adaptive value because broadening builds enduring personal resources, like social connections, coping strategies, and environmental knowledge. ... These findings suggest that positive affect – by broadening exploratory behavior in the moment – over time builds more accurate cognitive maps of what is good and bad in the environment. This greater knowledge becomes a lasting personal resource. ... Put differently, because the broaden-and-build effects of positive affect accumulate and compound over time, positivity can transform individuals for the better, making them healthier, more socially integrated, knowledgeable, effective, and resilient. ... This evidence motivates our prediction that positive affect is a critical ingredient within flourishing mental health.

Adaptive Flexibility and Local vs. Global Stability

Frederickson and Losada (2005, p. 680) define emotions as dynamic, complex ‘multicomponent systems that dynamically alter patterns of thinking, behavior, subjective experience, verbal and nonverbal communication, and physiological activity’ that reflect ‘two intertwined core concepts within nonlinear dynamic systems – namely, local unpredictability and global stability.’ They see adaptive flexibility as a hallmark of our emotional systems and their impact. After reviewing research on heart rate variability and the view that ‘fast and accurate perception seems to depend on chaotic neural systems,’ they find: ‘In both cardiac and neurological systems ... seemingly unpredictable local changes give rise to stable and flexible global outcomes.’ They apply this to human systems:

A similar dynamic emerges for positive affect systems. Given that positive affect broadens momentary thought-action repertoires whereas negative affect narrows those same repertoires, people are indeed less predictable in positive states than in negative states. The broaden-and-build theory holds that the momentary unpredictability characteristic of positive states over time yields resilience that allows people to flexibly adapt to inevitable crises. The links among positivity, local unpredictability, and global stability have been demonstrated empirically at multiple levels of analysis. Within individuals, people induced to feel positive emotions ... report wider arrays of action urges in the moment, which would make predicting their behavior more difficult. Relatedly, people’s trait positivity predicts greater variability and complexity within the microdynamics of their moment-to-moment moods. Despite this momentary unpredictability of affect and behavior, over time, people who regularly experience positive affect exhibit greater resilience to adversity. Within married couples, greater marital happiness is associated with less predictability from moment to moment as spouses interact, and yet, over time, these marriages are the ones most likely to last. Within business teams, higher levels of expressed positivity among group members have been linked to greater behavioral variability within moment-to-moment interactions as well as to long-range indicators of business success. And within organizations, positive experiences have been linked to broader information processing strategies and greater variability in perspectives across organizational members as well as to organizational resilience in the face of threat. The commonalities between affect systems and nonlinear dynamic systems raise the possibility that the complex dynamics of chaos underlie the proposed link between positive affect and human flourishing.

Interhorizontal Complementarity, Learning and Positivity

This information poses a challenge to ‘interhorizontal complementarity,’ raising questions on whether ‘horizon effects’ are contagious, if longer horizons make one’s short-run behavior less predictable. But a broader repertoire of behavioral options – and all learning activity – comes with horizontal growth. Greater short-term variability through a willingness to explore novel ideas and options in a pursuit of knowledge is likely infectious on others. Short-term variability is a part of learning activity; one tries new things to discover effects. Frederickson and Losada (2005, pp. 680-81) describe research ‘suggest[ing] that high ratios of positive to negative affect would distinguish individuals who flourish from those who do not.’ They cite ‘studies show[ing] that mild positive affect characterizes the modal

human experience' and state: 'This positivity offset equips individuals with the adaptive bias to approach and explore novel objects, people, or situations' though "bad is stronger than good" ...

The implication is that to overcome the toxicity of negative affect and to promote flourishing, experiences of positivity may need to outnumber experiences of negativity, perhaps at ratios appreciably higher than those typically represented in the modal positivity offset. ...The reformulated balanced states of mind model suggests that optimal mental health is associated with high ratios of positive to negative affect.

Learning activity yields a positive emotional affect; its long-run impacts show up in the form of 'global stability' due to greater resilience in the face of crisis, surprise and disruption. But there is a role for 'negativity' here, and 'positivity' must be genuine to foster healthy behavior. As Frederickson and Losada (2005, pp. 684-85) explain, 'problems can occur with too much positivity and appropriate negativity may play an important role within the complex dynamics of human flourishing. Without appropriate negativity, behavior patterns calcify. We use the term appropriate negativity because we suspect that certain forms of negativity promote flourishing better than others' such as for resolving conflict in marriage (vs. disgust and contempt which 'are more corrosive').

Just as negativity within the dynamics of human flourishing must be appropriate, positivity must be both appropriate and genuine. Studies of human nonverbal behavior document that smiles that are ingenuine or otherwise disconnected from current circumstances lose credibility as expressions of internal states and correlate with regional brain activity typical of negative emotions and abnormal heart function, suggesting that feigned positivity may be more negative than positive. These findings underscore the importance, in the pursuit of human flourishing, of seeking genuine positivity – meaningfully grounded in the reality of current circumstances – rather than feigned, forced, or trivial positivity.

This is Pert's (1997, pp. 192-93) point, that 'all emotions are healthy, because emotions are what unite the mind and the body. ... All honest emotions are positive emotions.' So now we must summarize this discussion.

Conclusion and Summary

This paper asks how we best should organize to promote human well-being. Is competition or cooperation superior for this purpose? Most economists see competition as efficient and beneficial. In network contexts, substitution and complementarity are tangled together. Since complementarity calls for cooperation, the case for competition needs to be questioned in such settings. Which relation is dominant? Do we have an answer? The issue rests on decreasing vs. increasing returns. The foundation for diminishing returns is specious, save in short-run production (Jennings 2015b); the long-run case shows increasing returns, implying complementarity in long-run applications (Kaldor 1972, 1975). For intangibles and horizons, substitution does not apply; the case for cooperation is strong (Jennings 2015a, 2016). This paper makes a claim for cooperation on health effects.

Two cultures of competition and cooperation were defined as based on fear vs. love, where rivalry emphasizes stress, strife and opposition in an individualistic culture resistant to human community. This culture of fear is contrasted with cooperation, based on complementarity, affiliation and concerts of interest. In this setting, community counts along with interdependence, with caring and compassion hallmarks of love.

The relevance of 'horizon effects' was introduced, to underline their importance for evaluating these systems. Here, learning and resilience are standards of system performance. Competition and cooperation as cultures of 'fear' and 'love' are alternative frames for human welfare. Research in human health illuminates this choice.

Management theory identifies symptoms of ill health – of 'frustration, failure, short time perspective and conflict' – that disrupt functionality, fragmenting effort due to 'competition, rivalry, intersubordinate hostility and ... a focus toward the parts rather than the whole' (Argyris 1971, pp. 262-63, 268-69). This suggests an image of our economic

culture as showing pathological symptoms of illness due to higher-order need deprivation as McGregor (1971, pp. 310-11) described. Kohn's (1986, pp. 55, 143) view is even more negative: 'competition ... does not promote excellence. ... The chief result of competition ... is strife.' If so, competition is the problem, manifesting pathological symptoms reflected in 'horizon effects' and organizational stress.

Findings in neuropsychology yield a competitive failure with impacts on human health. Basing incentives on opposition is not conducive to flourishing if we are social creatures. Being hard-wired for empathy and designed in favor of fellowship portrays competition as severing connections with harmful effects. Social support is a key to physiological functionality and psychological health. Social isolation is a cause of illness – 'a major risk factor for morbidity and mortality' – affecting 'daily emotional life' (Norris and Cacioppo 2007, p. 88). The World Health Organization calls stress 'a determining factor of ... different diseases' (Kudielka et al. 2007, pp. 56-57) including abnormal heart rhythms, immunosuppressive effects, infection and diabetes (Taylor and Gonzaga 2007, p. 456). If humans have 'an affiliative neurocircuitry ... in response to stress,' when 'social contacts are hostile or unsupportive' in a culture of competitive 'fear', then 'psychological and biological stress responses are heightened. If social contacts are supportive and comforting, stress responses decline' (Taylor and Gonzaga 2007, p. 457). An economic culture resistant to affiliation is not conducive to mental or physiological health.

Positive feelings themselves show important health effects; suppressed anger can lead to cancer and disease (Pert 1997, pp. 190-93). Emotional states affect the heart, in cardiovascular health and 'psychophysiological coherence' which synchronizes bodily rhythms with optimal mental function and emotional balance. Here, 'love and appreciation' bring coherence and horizontal growth (McCraty, Bradley and Tomasino 2004/5, pp. 16-18).

In short, positive emotions appear to broaden the scope of perception, cognition, and behavior and to enhance creative and intuitive capacities. Conversely, negative emotions tend to restrict perception, produce more reactive, rigid, and stereotypic patterns of thought and action, and have been found to be associated with reduced task performance and impaired intuitive judgments.

The research shows that 'appreciation, care, compassion and love' (Tomasino 2007, pp. 530-31) along with 'giving [and] nurturing ... associated with wholeness' (Arguelles, McCraty and Rees 2003, p. 20) are a vital part of any system meant to promote human welfare or 'flourishing.'

'Flourishing' entails living 'within an optimal range of human functioning' (Frederickson and Losada 2005, p. 680). Positive feelings toward others are a feature of flourishing; a competitive fear-based system fails on these criteria, while a cooperative frame nurtures compassion. This is how love fosters healthy relations and better performance, so is conducive to human welfare. The notion of 'flourishing' is horizontal; longer planning horizons as an index of maturity yield an organizing principle in need of further research. With psychologists showing how horizontal growth is supported and economists seeing all this as a complementary process, a needed shift in social cultures from opposition toward compassion might be achieved. The use of substitution assumptions in economics is wrong, and has harmful effects. We need a transition from fear to a shared love for each other.

Conflict of Interest Statement

The author declares that there is no conflict of interest.

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Endnotes

[1] 'Horizon effects' are defined as an ordinal shift in our ranges of awareness or of our planning horizons as embedded in our decisions.

[2] Where 'want' is measured in monetary terms by people's 'willingness to pay' while ignoring the role of 'income effects' on distributional outcomes.