Gratification and flourishing: well-being in interaction

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Abstract

A long tradition of thought identifies two distinct but inter-related dimensions of well being – *gratification* and *flourishing*. Relying on insights from relational psychoanalytic theory, we devise a modeling approach based on an analogy with electric circuits, where gratification is represented by *electric current* and flourishing by *electric power*. We explore how the latter is influenced non-monotonically by challenges and their perceived values, as represented in the model by loads and resistance.

Further psychoanalytic conceptualizations suggest how to extend the electric circuits metaphor for modeling mutual influence among related individuals. This extension gives rise to a definition of a *social equilibrium*. We prove existence, and show that there might exist 'flourishing traps' - social equilibria dominated by other social equilibria with enhanced flourishing for everybody and with no decrease in gratification. We discuss how 'flourishing traps' differ from classical coordination failures, and the implied nature of guidance for public policy.

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1 Introduction

There is a long tradition of thought which distinguishes two inter-related but distinct dimensions of human well-being, namely *gratification* and *flourishing*. To give just few and very sparse cursors, in ancient Greek philosophy the former was coined *Hêdonês*, the latter *Eudaemonia*; John Stewart Mill (1863) famously wrote that "*It is better to be a human being dissatisfied than a pig satisfied; better to be Socrates dissatisfied than a fool satisfied*"; Robert Nozick (1974) claimed that most people would rather not connect to an 'experience machine' which would simulate in their brain any experience they like, because "*perhaps what we desire is to live (an active verb) ourselves, in contact with reality.*"

If, indeed, no amount of *bread and circus* can make up for a feeling of meaninglessness, but concurrently a minimal amount of bread, clothes and shelter is a pre-condition for thriving; and if revealed behavior does not always lead towards a balanced improvement of gratification and flourishing, then any responsible public policy should attend to both dimensions, and cater for the interdependence and (only partial) correlation between the two.

To this effect, relying on insights from contemporary psychology and in particular from relational psychoanalytic theory (section 2), we propose in this paper a model of individual well-being based on an analogy with electric circuits, in which gratification is reflected by electric *current* and flourishing by electric *power* (section 3). In particular, we show how the latter is influenced non-monotonically by challenges and their perceived values, as represented in the model by loads and resistance. In section 4 we extend the model to allow for mutual influence between individuals in social interaction, and show how social equilibria might exhibit 'flourishing traps'. We conclude with implications for public policy in section 5.

2 Insights from relational psychoanalytic theory

The 'relationality' (Mitchel, 2000) strand in contemporary psychoanalytic theory refers today to a host of central and influential theories which emphasize how the psyche evolves along one's life within a field of human influences. These theories contrast with Freud's structural model by which irrespective of the environment, the libidinal forces of the *id* search for objects of desire

to discharge at, where tension discharge leads to gratification, and lack of discharge to frustration; the *superego* internalizes certain culturally-dictated prohibitions and bar various discharge opportunities; and the *ego* has the delicate task of mediating between the volcanic, libidinal bursts of the id and the prohibitions of the superego, a mediation which is successful when the drives undergo *sublimation*, in particular when the sex drive finds a moderated expression in romantic love.

We will consider here three psychoanalytic theoreticians espoused by the relational strand: Hans Loewald (1906-1993), who was a *neo-Freudian*; Donald Winnicott (1896-1971), one of the founders of the *object-relations* approach; and Heinz Kohut (1913-1981), the founder of *self psychology*. These three original, giant minds independently introduced breakthrough concepts, with very few allusions to one another in their writings, but from today's perspective their ideas strongly resonate and complement one another.

According to the three of them, for the newborn baby initially there does not yet exist a differentiation between an 'inside' (self) and an 'outside' (world); there is rather a primordial unity of a mother-infant *field* (or *matrix*). Within this unity the infant feels omnipotent, because, for instance, the feeling of hunger is soothed by the 'automatic' appearance of the feeding breast. However, increasing delays in parents' responsiveness to the baby lead to *constructive frustration*, and gradual crystallization of a *self* separate from world, with the emerging recognition of what is under the child's control and what depends on external forces. The parents provisioning of a *holding environment* and *mirroring* to the baby is natural but critical for the healthy outcome of the separation process.

According to Loewald (2000), with a healthy outcome of this separation process the original unity of the mother-child field is reorganized at a higher level of both differentiation *from* the world and connection *to* the world. Healthy mature individuals oscillate between greater separateness from the world (e.g. in methodical planning) and feeling at one with the world (e.g. in playful or artistic or religious experiences), but don't reach any of the two opposing unhealthy extreme ends of this oscillation: neurosis, on one end, with complete separation of 'self' from 'world', where functioning is feasible, but all meaning is lost, the world seems senseless, and existence feels 'dead'; and psychosis and schizophrenia, on the other end, with a collapse of the separation between 'self' and 'world', where internal 'thoughts' and external 'things' become one and the same.

In contrast with the Freudian structural model, for Loewald drives begin

to emerge only *after* the separation from the mother-child loving unity, because discharge necessitates a *distance* between source and target. Mature *Eros* is thus – again in contrast with Freud – an experience of love consisting of *both* discharge and tension.

According to Winnicott (1971), the healthy separation process is assisted by the *transitional object* (e.g. a teddy bear, a soothing blanket) about which children do not get asked whether they found it (in the external world) or 'created' it (made it appear by their will, much like the feeding breast 'appeared' to their will). Playing with the transitional object evolve into experiences in the *transitional space* (between 'self' and 'world'), which further develops into the *potential space*, where all artistic, playful, creative and meaningful experiences take place. For the transitional space and the potential space to develop, some resistance on the part of the mother is due while nursing, a resistance which would mandate the infant to make an effort; with no such resistance, the infant is "not satisfied with satisfaction" and "feels fobbed off" because "he has been put off by an opiate, the feed." (Winnicott 1945, p. 141.)

According to Kohut (1977), under favorable conditions the newborn's perceived omnipotence develops into a *self* consisting of *tension arc* from a pole of assertiveness to a pole of ideals. Gratifying *Narcissism* is actually healthy to the extent that it enhances the constitution of this tension arc. Concurrently, when parents and role models mirror the child to himself/herself, and portray ideals, they are 'incorporated' as *selfobjects* within one or both poles in a process of *transmuting internalization*. A flourishing joyful self is a *precondition* for both the very emergence of drives, *and* for the benign resolution of conflicts that the drives raise (like the Freudian Oedipus complex). A *fault* in the self's tension arc might lead to a fragmented self, to *exhibitionism* when assertiveness overflows and ideals are meager, and to *voyeurism* in the reverse case.

To sum up, according to all three thinkers we are consciously seeking gratification (discharge of tension), but maintaining some tension is essential for flourishing. Under appropriate conditions (*some* resistance, barriers) gratification increases flourishing, but under other conditions it causes disintegration and diminished flourishing.[1]

[1]It is worthwhile commenting on the epistemic standing of these psychoanalytic theories. They can be thought of as:

1. a frame of mind, though not refutable as a paradigm in and by itself, gives rise to

3 The electric metaphor

We are now going to propose a framework for modeling the above ideas, based on an analogy with an electric circuit.

3.1 The self

In the circuit (see Fig.1), a *current source* represents the self's pole of assertiveness/ ambitions. The current supplied by the current source to the circuit represents *vitality* or *libidinal flow*. The current is of stable size $\tilde{I}$, but only as long as the resulting overall voltage in the circuit does not exceed the

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a host of particular refutable hypotheses that can then be tested, solidifying the paradigm whenever they indeed get confirmed, as e.g. in Banai et al. (2005) (much like Darwin's paradigm of evolution by natural selection is not refutable in and by itself, but rather gets solidified as numerous particular hypotheses based on it are confirmed);

2. As a paradigm within which refutable hypotheses get confirmed (as above), but using for testing them not only the five physical senses, but also the sense of empathy, to be understood not as an emotion (i.e. not sympathy) bur rather as the human capacity for vicarious introspection (Kohut 1977, chapter 3: Reflections on the Nature of Evidence in Psychoanalysis; see also Ogden, 2015), which among the human capacities is the most natural for assessing psychic material. The fact that empathy takes place within an interaction between two human subjects that influences the observed subject (somewhat like, in quantum physics, observing a particle influences its behavior according Heisenberg's uncertainty principle) suggests that the observer should adhere to particular professional heuristics in order to minimize observational biases (just as, for example, sight illusions are not altogether avoided but do get minimized by professional observation heuristics), not that vicarious introspection should be avoided altogether as an observational capacity;

3. As a frame of mind to be assessed pragmatically, by its usefulness for professional caretakers to make sense of the large amount of material they observe during therapeutic sessions, a sense on the basis of which the approach they devise ultimately helps patients to get better. This pragmatic epistemic stance therefore dispenses with the question whether terms like 'potential space' or 'tension arc' are literally meaningful, and contents itself if these conceptualizations are useful vehicles for eventually improving patients' quality of life (as assessed by the patients themselves) when these conceptualizations are employed by their caretakers.

These three epistemic stances do not compete but rather complement one another.

current source's *compliance voltage* $V_{\max}$.[2] Thus, if the overall resistance of the circuit is R, the overall current discharged into the circuit will be

$$I = \min\left\{\tilde{I}, \frac{V_{\max}}{R}\right\}$$

representing the self's level of *gratification*. If $\tilde{I} > \frac{V_{\max}}{R}$, then $\tilde{I} - \frac{V_{\max}}{R}$ represents *frustration*, i.e. unrealized libidinal flow.

The current source feeds a parallel circuit which has $k = 1, ..., K$ parallel branches, each representing a *practice*, i.e. a potentially meaningful, creative activity in the *potential space* (according to Winnicott's conceptualization), or, equivalently, an assertive activity pursuing an ideal set by a role model which got internalized as a *selobject* (according to Kohut's theory of the self).[3]

Every one of the K parallel branches (each representing a practice) has two components, connected in a series within the branch:

1. A light bulb load with resistance $L_k > 0$. The load L_k represents the extent to which the practice is challenging.

2. A resistor with resistance $\frac{1}{A_k}$ where $A_k \geq 0$ represents the value/meaningfulness of practice k for the individual. $A_k = 0$ means infinite resistance, i.e. the

[2] Technically, a current source can be implemented by a battery with the compliance voltage $V_{\max}$ coupled with a device which varies the internal resistance of the battery so as to guarantee that the current is $\tilde{I}$ – as long as the (external) resistance R of the circuit does not exceed $\frac{V_{\max}}{\tilde{I}}$ (see e.g. Harrison, 2005).

[3] The neo-Aristotelian philosopher Alisdair MacIntyre (2007) defines a practice as

> any coherent and complex form of socially established cooperative human activity through which goods internal to that form of activity are realized in the course of trying to achieve those standards of excellence which are appropriate to, and partially definitive of that form of activity, with the result that human powers to achieve excellence, and human conceptions of the ends and goods involved, are systematically extended. Tic-tac-toe is not an example of a practice in this sense, nor is throwing a football with skill; but the game of football is, and so is chess. Bricklaying is not a practice; architecture is. Planting tulips is not a practice; farming is. So are the enquiries of physics, chemistry and biology, and so is the work of the historian, and so are painting and music (p.187).

practice is not feasible or is irrelevant for the individual; the larger A_k, the smaller $\frac{1}{A_k}$ and the more meaningful/idealized is practice k.

The overall resistance in branch k is

$$R_k = L_k + \frac{1}{A_k}$$

At their ends, the branches join again (at the 'pole of ideals') and connect back to the current source, thus closing the circuit.

3.2 Choice

The individual has to decide how to distribute the available vitality flow I among the different practices $k = 1, ..., K$

$$I = \sum_{k=1}^{K} I_k$$

where I_k is the current through branch k. The individual strives to discharge the total flow I at a minimal *rate of work.* If current I_k flows through branch k, the work per unit of time in this branch is the *electric power* in the branch

$$\Pi_k = I_k^2 R_k$$

and the overall rate of work is

$$\Pi = \sum_{k=1}^{K} \Pi_k = \sum_{k=1}^{K} I_k^2 R_k$$

The individual's constrained optimization problem is therefore

$$\min_{I_1,...,I_K} \Pi$$
$$\text{subject to } \sum_{k=1}^{K} I_k = I$$

whose first-order conditions are

$$\frac{\partial \Pi}{\partial I_1} = ... = \frac{\partial \Pi}{\partial I_K}$$

Since for $k = 1, ...K$

$$\frac{\partial \Pi}{\partial I_k} = \frac{\partial \left(\sum_{\ell=1}^{K} I_\ell^2 R_\ell \right)}{\partial I_k} = 2 I_k R_k$$

these first-order conditions reduce to

$$I_1 R_1 = ... = I_K R_K \equiv V$$

i.e. the voltages over all branches must have the same value, denoted by V. This voltage V must furthermore satisfy the problem's constraint

$$\sum_{k=1}^{K} \frac{V}{R_k} = \sum_{k=1}^{K} I_k = I$$

and hence the overall resistance of the circuit satisfies

$$R = \frac{V}{I} = 1 / \sum_{k=1}^{K} \frac{1}{R_k}$$

Remark 1. Our assumption that minimizing the rate of work Π is the individual's objective function thus led to the conclusion that the distribution of the current across the branches is as predicted by *Ohm's law*. For simplicity, we adhere to this assumption in what follows.
One may envisage a generalization of our exposition in which the target function comes from some *class* of functions, of which Π is only one particular example. Different target functions would give rise to different patterns of current distribution across the branches (i.e., different distributions of vital zest across the available practices).
A further generalization may consider, as a primitive, plausible properties of distribution patterns $I_1, ..., I_k$ of current (as a function of the distribution $R_1, ..., R_k$ of resistance across the branches), and explore conditions under which such distribution patterns arise (as if) from a constrained-optimization problem, in which the constraint is the overall current I to be distributed across the branches, and the target function possesses particular properties.

3.3 Flourishing

The voltage (the electric potential difference) over load k (only, i.e. not over the entire branch k that includes on top of L_k also the resistance $\frac{1}{A_k}$) is

$$V_k = I_k L_k$$

and the *electric power of load k* (the energy per unit of time, i.e. the amount of light produced by the bulb, assuming, ideally, that no losses of energy occur when electric energy is transformed by the bulb into light) is

$$P_k = I_k V_k = I_k^2 L_k$$

The overall electric power of the loads - representing the *flourishing* of the individual – is

$$P_0 = \sum_{k=1}^{K} P_k = \sum_{k=1}^{K} I_k^2 L_k$$

Remark 2. In the psychoanalytic theory literature surveyed in section 2, *gratification* is described as discharge of tension or potential in a *tension arc* (Kohut 1977) or *potential space* (Winnicott 1971), as is the current flow I in the circuit; and *flourishing* is described as the fruition of acting creatively vis-a-vis a challenge within maintained tension, as in the transformation of electric energy into light at the rate P_0 in the circuit.
Notice that the two dimensions of well being, *gratification* I and *flourishing* P_0, are related to but do not coincide with the target function Π of the constrained-optimization problem which determines the chosen distribution $I_1, ...I_K$ of flow among the practices $1, ..., K$. While Π encodes what revealed behavior (as if) tries to optimize, and (as mentioned in remark 1 above) one could envisage revealed behavior encoded by other target functions as well, the above mentioned psychoanalytic theory suggests that gratification I and flourishing P_0, as incommensurable dimensions of well being, are innate to human beings as such.

Remark 3. The two dimensions of gratification and flourishing pertain to well-being associated with practices in the sense elaborated in section 3.1 above. For day-to-day activities, in contrast, which are by definition more mundane in nature and hence also experienced, benefited and enjoyed

differently than do practices, the classical uni-dimensional utility encoding of revealed preferences may well be the relevant index of well-being.[4,5]

4 An example: a two practices circuit

Consider the example of a circuit with two branches (i.e. two practices) $k = 1, 2$. In such a case we have

$$R = \frac{1}{\frac{1}{L_1+\frac{1}{A_1}} + \frac{1}{L_2+\frac{1}{A_2}}}$$

and

$$V = \frac{I}{\frac{1}{L_1+\frac{1}{A_1}} + \frac{1}{L_2+\frac{1}{A_2}}}$$

The current through branch k is

$$I_k = \frac{V}{L_k + \frac{1}{A_k}} = \frac{\frac{I}{\frac{1}{L_1+\frac{1}{A_1}} + \frac{1}{L_2+\frac{1}{A_2}}}}{L_k + \frac{1}{A_k}}$$

[4]For instance, in the terms of MacIntyre's examples quoted in footnote 3 above, the choice of how to divide one's zest and passion between the practices of farming and architecture influences the person's extent of both gratification and flourishing. In contrast, within the scope of farming, the pros and cons of planting tulips or roses in a particular flowerbed at a particular moment, having to do e.g. with seed costs, labor involved, personal enjoyment of the flower types in one's field, and expected monetary yield of the crop, are best summarized along a unique dimension (which in this example may even be 'translated' to or coined in monetary terms).

[5]It is very well conceivable that day-to-day activity choices may affect how challenging (L_k) and meaningful (A_k) practices are (e.g., a success following planting a particular combination of crops may possibly make the practice of farming more meaningful while less challenging than before), and reversely the choice of how to divide one's passion across practices may influence one's preferences among certain day-to-day activities (e.g., devoting more passion to the practice of farming may increase the preference for better seeds relative to alternative day-to-day expenditures). We do not elaborate further on such potential mutual influences here; for a preliminary attempt at a unified framework encompassing in particular such mutual influences see Heifetz and Minelli (2007, p. 12-14).

The *electric power of load* k is

$$P_k = I_k V_k = I_k^2 L_k = \left(\frac{\frac{I}{\frac{1}{L_1+\frac{1}{A_1}}+\frac{1}{L_2+\frac{1}{A_2}}}}{L_k+\frac{1}{A_k}} \right)^2 L_k$$

The overall electric power of the loads - representing the individual's *flourishing* – is

$$P_0 = \sum_{k=1}^{2} P_k = \left(\frac{I}{1+\frac{L_1+\frac{1}{A_1}}{L_2+\frac{1}{A_2}}} \right)^2 L_1 + \left(\frac{I}{1+\frac{L_2+\frac{1}{A_2}}{L_1+\frac{1}{A_1}}} \right)^2 L_2$$

4.1 Comparative statics w.r.t. A_2

How does flourishing (loads' electric power, i.e. the intensity of light produced by the electric bulbs) change as the meaningfulness/attractiveness A_2 of practice 2 increases from 0 (practice infeasible/irrelevant) to a positive value (practice is meaningful/attractive)?

We prove the following proposition in the appendix.

Proposition 1. Flourishing P_0 as a function of the value A_2 has a minimum point at $A_2 = \frac{A_1 L_1}{L_2} > 0$.

This means that if we start with a unique meaningful practice $k = 1$ that has load L_1 and meaningfulness/attractiveness A_1, and then introduce a second practice with load L_2, initially (i.e. for small A_2) the overall flourishing (loads' electric power, i.e. the overall intensity of light) of the system will *decrease* before it gets to increase (when A_2 bypasses $\frac{A_1 L_1}{L_2}$).

This initial decrease is compatible with, for instance, repeated observations of what happens to aboriginal societies, with their traditional practices, when they get introduced to an additional practice of shallow meaning like alcohol consumption. The new practice attracts and absorbs time and effort away from the traditional practices, but this revealed preference for the new practice induces a sharp decrease of flourishing, witnessed e.g. by abundance of suicide cases (Scott-Clark and Levy 2006, Wahlquist 2016).

4.2 Comparative statics w.r.t. R

If we multiply $L_1, \frac{1}{A_1}, L_2, \frac{1}{A_2}$ by the same factor $\beta > 1$, then

$$R = \frac{1}{\frac{1}{L_1+\frac{1}{A_1}} + \frac{1}{L_2+\frac{1}{A_2}}}$$

will be multiplied by β as well.

In the appendix we prove the following proposition.

Proposition 2. Flourishing P_0 increases when multiplying $L_1, \frac{1}{A_1}, L_2, \frac{1}{A_2}$ (and hence R) by the same factor $\beta > 1$ as long as $IR \leq V_{\max}$; a further increase of β decreases flourishing P_0.

Hence there are two regions. When the loads L_1, L_2 are small (i.e. the practices are not very challenging), multiplying them by a factor $\beta > 1$ (and compensating accordingly the meaningfulness A_1, A_2 by the same factor) makes the corresponding practices more challenging, and flourishing is increased. However, beyond a certain point, making the practices even more challenging[6] causes *frustration*, some of the vital current I does not get to flow into the system but rather gets lost[7] and flourishing gets decreased.[8]

[6] with the same compensating factor on meaningfulness.

[7] e.g. on exhibitionism, in Kohut's *Self psychology.*

[8] In this respect, see the following passages, regarding the balance of challenges, from the essay *Reflections Concerning the Causes of Liberty and Social Oppression,* by Simone Weil (1958), p. 95-96 (*our emphasis*):

> The only mode of production absolutely free would be that in which methodical thought was in operation throughout the course of work. *The difficulties to be overcome would have to be so varied* that it would never be possible to apply ready-made rules; not of course that the part played by acquired knowledge would be nil; but it is necessary that the worker should be obliged always to bear in mind the guiding principle behind the work in hand, so as to be able to apply it intelligently to ever-new sets of circumstances.
>
> (...) Furthermore, it goes without saying that *the degree of complexity of the difficulties to be solved must never be too great*, on pain of bringing about a split between thought and action.
>
> (...) To achieve this end it would be enough if man were no longer to aim

5 Social network and social equilibrium

Up till now, we have considered all the parameters as constant and given – the vitality current $\tilde{I}$ from the pole of assertiveness/ambitions, the maximum feasible voltage $V_{\max}$, and the extent to which the practices $k = 1, ..., K$ are meaningful (A_k) and challenging (L_k). However, in the course of social interaction, role models get internalized within the self and become what Kohut coined *selfobjects*, potentially influencing both the extent of assertiveness I and the extent to which practices are deemed as meaningful (A_k).

In what follows, we will assume that the influence of each selfobject on the meaningfulness A_k of practice k for the individual is larger the 'closer' is the internalized selfobject as a role model regarding this particular practice, and the more that role model is himself flourishing while performing this practice. Likewise, we will assume that the influence of a role model on the individual's assertiveness source current I is larger the 'closer' is the internalized selfobject as a parent or a parent figure for the individual, and the more that parent or parent figure is flourishing herself.

Formally, individuals $n = 1, ..., N$ are related in a directed network, so we index all the above variables by superscript n. Furthermore, let d_k^{mn} be the 'distance' from individual m to individual n pertaining to practice k (standing for the extent m is a 'role model for practice k' internalized selfobject, within the self of individual n). Likewise, d_0^{mn} is the distance from individual m to individual n pertaining to fostering n's pole of assertiveness and ambitions.

As a result, for each individual n and practice k,

$$A_k^n = F_k^n \left(\sum_{m \neq n} \frac{P_k^m}{d_k^{mn}} \right) \tag{1}$$

where F_k^n is a non-negative, increasing continuous function of the other individuals' P_k^m flourishing in practice k, divided by their corresponding distance

at extending his knowledge and power indefinitely, but rather at establishing, both in his research and in his work, *a certain balance* between the mind and the object to which it is being applied.

The optimal β, which maximizes flourishing P_0, may be viewed as representing the balance to which Weil alludes.

d_k^{mn}. Likewise,

$$\tilde{I}^n = F_0^n \left(\sum_{m \neq n} \frac{P_0^m}{d_0^{mn}} \right) \tag{2}$$

where F_0^n is a non-negative, increasing continuous function of the other individuals' P_0^m overall flourishing, divided by their corresponding distance d_0^{mn}.

These increments create feedback across the individuals, because the resulting increase in A_k^n and $\tilde{I}^n$ affects n's own loads' electric power levels

$$P_k^n = (I_k^n)^2 \, L_k^n \tag{3}$$

where

$$I_k^n = \min \left(\frac{\tilde{I}^n}{\left(L_k^n + \frac{1}{A_k^n} \right) \sum_{\ell=1}^{K} \frac{1}{L_\ell^n + \frac{1}{A_\ell^n}}}, \frac{V_{\max}^n}{L_k^n + \frac{1}{A_k^n}} \right) \tag{4}$$

and

$$P^n = \sum_{k=1}^{K} P_k^n, \tag{5}$$

in turn affecting the values A_k^m and $\tilde{I}^m$ of those m's for whom n is a *selfobject* (i.e., those for whom d_k^{nm} or d_0^{nm} are finite).

Definition. A *social equilibrium* is a tuple $(P_k^n, I_k^n, A_k^n)_{n=1,...N,,k=1,...K}$ satisfying equations (1), (4), (5).

In the appendix we prove the following theorem:

Theorem. A social equilibrium exists.

Social equilibria may have the same realized current I^n for all individuals $n = 1, ..., N$, but at the same time be 'Pareto-ranked' in terms of the individuals' flourishing levels P_0^n. The social equilibrium with the lower flourishing levels is thus a 'flourishing trap', due to the unfortunate low meaning communally attached to some practices which, in the more favorable social equilibrium, are communally deemed as more meaningful. We give an example for this phenomenon in the appendix.

6 Conclusion

The existence of social equilibria which are 'flourishing traps' call for policy intervention of a different kind than the ones called for by coordination failures in classical economics. In the latter, all individuals involved in the coordination failure would *a priori* declare, if asked, that they would be happy to move together with everybody else to the Pareto-dominating equilibrium. Pulling out of a flourishing trap, in contrast, is not about changing one's acts but rather about changing the practices one finds meaningful – a thought experiment very hard to perform in advance given that whatever is currently meaningful for us shapes our thoughts and the way we interpret received data.

Thus, some kind of cautious paternalism, involving some form of education or socialization process, is typically necessary for extricating from a flourishing trap. We haven't defined in this paper stability notions for social equilibria, but with an appropriate such definition one could envisage that some flourishing traps may actually be unstable, and hence require only mild intervention for such beneficial extrication. At the same time, particular caution is called for on the part of policy makers, as neither are they immune to the blind spots their own cherished practices impose on their assessments of others' flourishing and the relevant policies for improving it.

7 Appendix

7.1 Proof of proposition 1

The partial derivative of P_2 w.r.t. A_2 is

$$\frac{\partial P_2}{\partial A_2} = \frac{2I^2 A_1 A_2 L_2 \left(A_1 L_1 + 1\right)^2}{\left(A_1 + A_2 + A_1 A_2 L_1 + A_1 A_2 L_2\right)^3} > 0$$

so the more attractive is practice 2 deemed, the higher the electric power over load 2. At the same time, the partial derivative of P_1 w.r.t. A_2 is

$$\frac{\partial P_1}{\partial A_2} = -\frac{2I^2 A_1^2 L_1 \left(A_1 L_1 + 1\right)\left(A_2 L_2 + 1\right)}{\left(A_1 + A_2 + A_1 A_2 L_1 + A_1 A_2 L_2\right)^3} < 0$$

so the more attractive is practice 2, the lower the electric power over the other load. Together, the partial derivative of overall flourishing, $P = P_1 + P_2$ w.r.t.

A_2 is

$$\frac{\partial P_0}{\partial A_2} = \frac{2I^2 A_1 \left(A_1 L_1 + 1\right)\left(A_2 L_2 - A_1 L_1\right)}{\left(A_1 + A_2 + A_1 A_2 L_1 + A_1 A_2 L_2\right)^3}$$

Since all variables are non-negative,

$$\frac{\partial P_0}{\partial A_2} = 0$$

only when

$$A_2 = \frac{A_1 L_1}{L_2}$$

and this is a minimum point of flourishing (loads' electric power) because

$$\frac{\partial^2 P_0}{\partial A_2^2} =$$

$$= \frac{2I^2 A_1 \left(A_1 L_1 + 1\right)\left(3A_1^2 L_1^2 + 3A_1^2 L_1 L_2 - 2A_2 A_1 L_1 L_2 + 3A_1 L_1 - 2A_2 A_1 L_2^2 + A_1 L_2 - 2A_2 L_2\right)}{\left(A_1 + A_2 + A_1 A_2 L_1 + A_1 A_2 L_2\right)^4}$$

$$=_{\left|A_2 = \frac{A_1 L_1}{L_2}\right.} \frac{2I^2 L_2^4}{A_1^2 \left(A_1 L_1 + 1\right)^2 \left(L_1 + L_2\right)^3} > 0$$

■

7.2 Proof of proposition 2

When multiplying $L_1, \frac{1}{A_1}, L_2, \frac{1}{A_2}$ (and hence R) by the same factor $\beta > 1$, flourishing

$$P_0 = \left(\frac{I}{1 + \frac{L_1 + \frac{1}{A_1}}{L_2 + \frac{1}{A_2}}}\right)^2 L_1 + \left(\frac{I}{1 + \frac{L_2 + \frac{1}{A_2}}{L_1 + \frac{1}{A_1}}}\right)^2 L_2$$

will also increase by the factor β – as long as

$$IR \leq V_{\max}$$

However, once $IR > V_{\max}$, the current through branch k will be $\frac{V_{\max}}{L_k + \frac{1}{A_k}}$, and overall flourishing will be

$$P_0 = \left(\frac{V_{\max}}{L_1 + \frac{1}{A_1}}\right)^2 L_1 + \left(\frac{V_{\max}}{L_2 + \frac{1}{A_2}}\right)^2 L_2$$

thus *decreasing* by the factor $\beta > 1$ when $L_1, \frac{1}{A_1}, L_2, \frac{1}{A_2}$ are all multiplied by the factor β. ■

7.3 Proof of social equilibrium existence

For each individual n and practice k,

$$A_k^n = F_k^n \left(\sum_{m \neq n} \frac{P_k^m}{d_k^{mn}} \right) \tag{6}$$

where F_k^n is a non-negative, increasing continuous function of the other individuals' flourishing in practice k, P_k^m , divided by their corresponding distance d_k^{mn}. Recall also that overall flourishing of individual n is

$$P_0^n = \sum_{k=1}^{K} P_k^n$$

and her vitality flow is

$$\tilde{I}^n = F_0^n \left(\sum_{m \neq n} \frac{P_0^m}{d_0^{mn}} \right) = F_0^n \left(\sum_{m \neq n} \sum_{\ell=1}^{K} \frac{P_\ell^m}{d_0^{mn}} \right) \tag{7}$$

where F_0^n is a non-negative, increasing continuous function of the other individuals' P^m overall flourishing, divided by their corresponding distance d_0^{mn}.

From the definitions in the main text we also have:

$$R_k^n = L_k^n + \frac{1}{A_k^n} = \frac{L_k^n A_k^n + 1}{A_k^n} \tag{8}$$

$$R^n = \frac{1}{\sum_{\ell=1}^{K} \frac{1}{R_\ell^n}} = \frac{1}{\sum_{\ell=1}^{K} \frac{A_\ell^n}{L_\ell^n A_\ell^n + 1}} \tag{9}$$

so that

$$\frac{R^n}{R_k^n} = \frac{\frac{1}{\sum_{\ell=1}^{K} \frac{A_\ell^n}{L_\ell^n A_\ell^n + 1}}}{\frac{L_k^n A_k^n + 1}{A_k^n}} = \frac{A_k^n}{(L_k^n A_k^n + 1) \sum_{\ell=1}^{K} \frac{A_\ell^n}{L_\ell^n A_\ell^n + 1}}$$

and

$$I_k^n = \min\left[\frac{\tilde{I}^n R^n}{R_k^n}, \frac{V_{\max}^n}{R_k^n}\right] = \min\left[\frac{F_0^n\left(\sum\limits_{m\neq n}\sum\limits_{k=1}^{K}\frac{P_k^m}{d_0^{mn}}\right)\cdot A_k^n}{(L_k^n A_k^n+1)\sum_{\ell=1}^{K}\frac{A_\ell^n}{L_\ell^n A_\ell^n+1}}, \frac{A_k^n V_{\max}^n}{L_k^n A_k^n+1}\right]. \tag{10}$$

Notice, by (8) that I_k^n is therefore bounded from above by

$$\bar{I}_k^n = \frac{V_{\max}^n}{L_k^n}$$

and below by 0.

The flourishing of individual n in practice k is in turn defined by:

$$P_k^n = \left(I_k^n\right)^2 L_k^n \tag{11}$$

which is therefore bounded from above by

$$\bar{P}_k^n = \left(\bar{I}_k^n\right)^2 L_k^n = \frac{\left(V_{\max}^n\right)^2}{L_k^n}$$

and below by 0.

From (6) it hence follows that A_k^n is bounded from above by

$$\bar{A}_k^n = F_k^n\left(\sum_{m\neq n}\frac{\bar{P}_k^m}{d_k^{mn}}\right)$$

and below by 0.

Then for the compact convex domain

$$D = \prod_{n,k}[0,\bar{P}_k^n]\times[0,\bar{I}_k^n]\times[0,\bar{A}_k^n]$$

the continuous map

$$\Phi : D \to D$$

defined according to (11), (10) and (6) by

$$\begin{aligned}
&\Phi_k^n\left(\left(P_\ell^m, I_\ell^m, A_\ell^m\right)_{m,\ell}\right) \\
&= \left(\left(I_k^n\right)^2 L_k^n, \quad \min\left[\frac{F_0^n\left(\sum_{m\neq n}\sum_{\ell=1}^{K}\frac{P_\ell^m}{d_0^{mn}}\right)\cdot A_k^n}{\left(L_k^n A_k^n+1\right)\sum_{\ell=1}^{K}\frac{A_\ell^n}{L_\ell^n A_\ell^n+1}}, \frac{A_k^n V_{\max}^n}{L_k^n A_k^n+1} \right], \quad F_k^n\left(\sum_{m\neq n}\frac{P_k^m}{d_k^{mn}}\right) \right)
\end{aligned}$$

has a fixed point by Brouwer's fixed-point theorem, which constitutes a social equilibrium. ■

7.4 Example: flourishing Pareto-ranked social equilibria

Assume a social network with $n = 1, 2$ symmetric individuals, where

$$\begin{aligned}
F_0^1 &= F_0^2 \equiv \tilde{I} \\
F_1^1 &= F_1^2 \equiv A_1
\end{aligned}$$

are constant, i.e. the individuals don't influence each other's current $\tilde{I} = \tilde{I}^1 = \tilde{I}^2$ (don't serve for one another as assertiveness-enhancing parent figure selfobject), and don't serve either as selfobjects for practice 1 whose attractiveness is fixed at A_1 for both, but do serve as selfobjects for one another regarding practice 2, where

$$d_2^{12} = d_2^{21} \equiv d_2$$

and where the functions

$$F_2^1(\cdot) = F_2^2(\cdot) = \sqrt{\cdot}$$

are the square root. Assume, for simplicity, that $V_{\max}$ is high enough so as not to bind I, i.e. that gratification is $I = \tilde{I}$.

Given the symmetry between the two individuals in the network, when looking for a symmetric social equilibrium we have to solve

$$A_2 = \sqrt{\frac{P_2}{d_2}} = \sqrt{\frac{\left(\frac{I}{1+\frac{L_2+\frac{1}{A_2}}{L_1+\frac{1}{A_1}}}\right)^2 L_2}{d_2}} = \frac{I\sqrt{\frac{L_2}{d_2}}}{1+\frac{L_2+\frac{1}{A_2}}{L_1+\frac{1}{A_1}}}$$

which has two solutions:

$$\begin{aligned} \dot{A}_2 &= 0 \\ \ddot{A}_2 &= \frac{1}{A_1(L_1+L_2)+1}\left(I\sqrt{\frac{L_2}{d_2}}(A_1L_1+1) - A_1\right) \end{aligned}$$

with the corresponding flourishing levels

$$\begin{aligned} \dot{P} &= (I)^2 L_1 \\ \ddot{P} &= \frac{(I)^2 L_1}{\left(\frac{L_1+\frac{1}{A_1}}{L_2+\frac{(A_1(L_1+L_2)+1)}{I(A_1L_1+1)\sqrt{\frac{L_2}{d_2}}-A_1}}+1\right)^2} + \frac{(I)^2 L_2}{\left(\frac{L_2+\frac{(A_1(L_1+L_2)+1)}{I(A_1L_1+1)\sqrt{\frac{L_2}{d_2}}-A_1}}{L_1+\frac{1}{A_1}}+1\right)^2} \end{aligned}$$

When L_1 is small, A_1 is large, L_2 is large, and d_2 is small[9] we have

$$\ddot{A}_2 > \dot{A}_2 = 0, \quad \ddot{P} > \dot{P}$$

In such a social network the social equilibrium $\left(\dot{A}_2, \dot{P}\right)$ is a 'flourishing trap' in which practice 2 is deemed as irrelevant and practically non-existent, and consequently flourishing is lower than in the second social equilibrium $\left(\ddot{A}_2, \ddot{P}\right)$ in which practice 2 is respected and followed.

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[9] e.g. when $L_1 = .1$, $A_1 = 1$, $L_2 = 1$, $d_2 = .1$.

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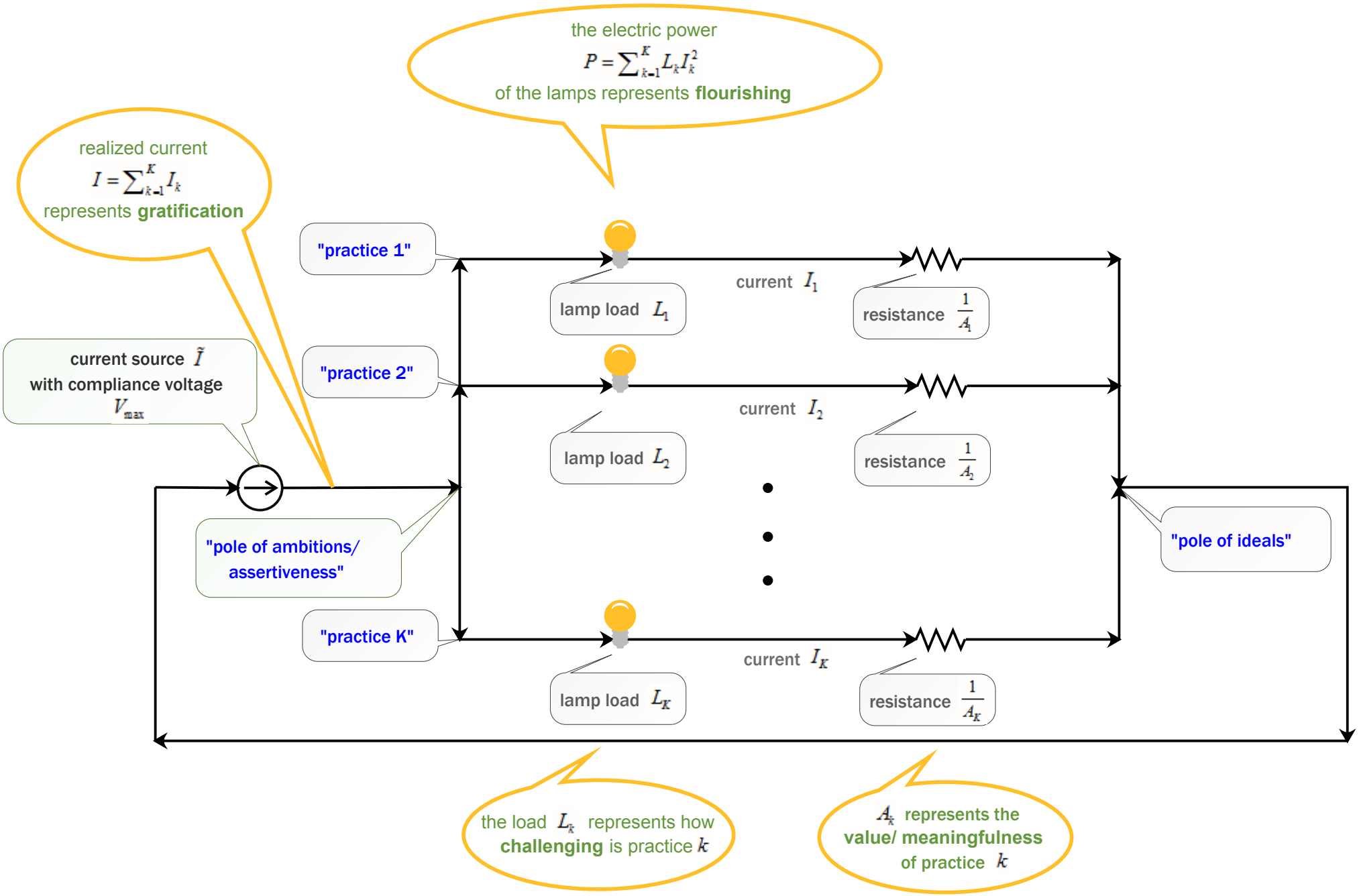

Figure 1: The electric circuit representing the self