Chapter 5
Social Volition and Cultural Prowess

> "The budget constraint shows the various bundles of goods that the consumer can afford for a given income. Here the consumer buys bundles of Pepsi and pizza."
> *N. Gregory Mankiw und Mark P. Taylor*[1]

The orthodoxy positions agency somewhere between an objective function (volition) and restricted action (prowess). Wedged between these, agency is a purely computational activity. Agents (consumers) tend to use their scope of action such that their objective function (happiness/utility) is maximised. With this methodical individualism in its analytical toolbox, the orthodoxy predicts human behaviour. Little Max has £20 pocket money (prowess) and shrewdly divides it over the price of however many Pepsis and pizzas (volition). The number of Pepsis and pizzas Little Max buys with however much pocket money is a typical prediction of the orthodoxy.

In the orthodoxy, volition can, but need not be directed towards a social goal. Little Max may want to consume his Pepsis and pizzas himself and not share them with others, or he may (also) use them to win favour among his friends. In QTC, *0/+consumption* serves only one social goal: the manipulation of social distance and proximity. Here volition is exclusively oriented towards the social. The orthodox theory is therefore more general than QTC. The upside of this is the ability to analyse even Robinsonades. Its downside is the shallowness it imposes on the cultural and social realms. The downside of QTC is its insensitivity to quantities and prices, and the upside is the depth to which it allows us to dive into the cultural and social realms.

1 Mankiw and Taylor 2008.

Another difference between the orthodoxy and QTC is epistemological interest itself. For the orthodoxy, volition (in the form of an objective function) is an input into the analysis. Its output is the prediction of consumer behaviour, based on this input which has fallen out of the sky. No reflection on the objective function and its motivation occurs, nor is it needed. In the orthodoxy, volition is simply anything that can be sought, as long as it can be pursued by an agency that can be thought of as calculation. Since volition can be anything, there is indeed no need for motivation. And since you don't need to motivate it, you can immediately accept it as a given: once there, always there!

In contrast, my considerations so far – and those in this chapter to be discussed in more detail – are primarily aimed at finding social volition in a *specific* objective function. This specific social volition is an output of the analysis and not its input. Like the orthodoxy, however, I also started with an input that fell out of the sky: humans strive for a place in the social, this place is determined by the specific social distance and proximity, which they can manipulate. At the beginning of the analytical journey, this social volition was as general a meta-preference as the volition for utility assumed by the orthodoxy. However, it then took on more specific forms from chapter to chapter. The current status of this specification of social volition is summarised in Table 6.

In the orthodoxy, prowess is defined by possession: Little Max has his weekly pocket money, later on he has his fortune, experience and a network. He also has what the orthodoxy calls cultural capital, i.e. his schooling, and the ability to move around in the social sphere like a fish in water or a bull in a china shop. Everything the agent possesses is used for volition, and the finitude of possessions limits their prowess. In the orthodoxy, different actions are solely due to different possessions and identical possessions always lead to identical actions.

In QTC, the consumer does not possess anything of their own that would allow them to act differently from others. All they have is what everyone else has: the world of objects, which, according to my assumption, is even available for free. All consumers use it to achieve their goals. Prowess is owed solely to culture. The prowess of the productive consumer is that summarised in Table 8. It depicts style leaders as Supermen and Supergirls who organise the world of objects according to their own interests, by providing their followers with instructions for its use. This is a win-win situation, a bigger win for the style leadership and a smaller one for their followers. So far, there are free lunches everywhere and no restrictions anywhere, just as if Little Max had overflowing pockets, or if Pepsi and pizza were available for free. But without any restrictions on capabilities, everyone would always revel in infinite happiness/utility. Individual agency would lose its analytical power altogether, and socially effective actions would lead all to Paradise. Without restrictions there is no economic problem – and this is also true of QTC.

What are the restrictions in *o/+consumption*? Prowess is limited by culture. Within the world of objects, cultural trade-offs have to be respected, which prevent infinite bliss. Social volition collides with the limitations of cultural prowess. It is only through this collision that agency is relevant as a creative force for the social. These are the topics addressed in this chapter.

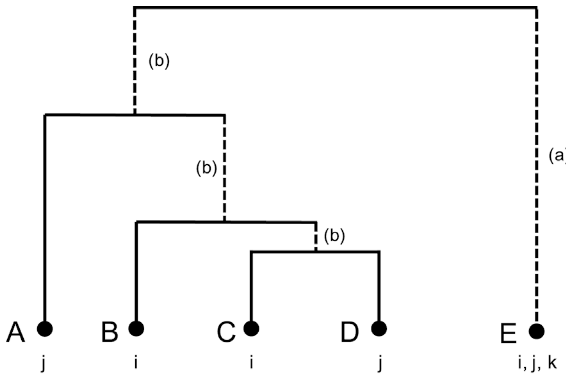
Proximity Clarified

As summarised in Table 6, the individual style moderates social proximity within the in-group. It is what distinguishes the individual from other members of their elective affinity despite all similarities, and what unites the individual with them despite all differences. Proximity, in other words, is the measure of individuality within the group to which the individual voluntarily belongs. All that makes an individual incomparable with their elective affinity alienates them from it. Everything that makes them comparable with their elective affinity, and is not identical, cultivates their individuality in it. Social proximity thus feeds on comparisons along the lines of 'more or less authentic, modern, original', etc., or more generally 'more or less pronounced in features of the common style of the elective affinity'. Social proximity thus develops from the gaze of all members of the in-group through the meta-contrasting lens that hides the incomparable within the group and shows the comparable (Table 5). Individual styles establish social proximity in the ordered world of objects, (X, ☐), by using the meta-contrasting lens to filter out dissimilarity as comparability, DIS_c, and/or diversity based on comparability, DIV_c. 'And/or' needs to be clarified. To that end, I first distinguish the common style, S, of the elective affinity from the individual styles, s_j, of the m members that constitute it. I then determine the *bilateral stylistic root*, R_{ji}, between an individual style, s_j, and any other individual style, s_i. Figure 6 serves to illustrate.

Let the elective affinity be composed of two members only, i and j. Their common style, S, consists of the subset of objects (A, B, C, D, E). The individual styles are nested in the common style as two subsets $(B, C, E)_i$ and $(A, D, E)_j$. Diversity based on comparability of the common style, DIV_c^c, is the sum of the vertical lengths in Figure 6. The bilateral root of the individual styles s_i and s_j has two components. The first component (a) consists of all vertical parts in the tree of the common style above the objects shown in *both* individual styles. The second component (b) consists of all *joint* vertical parts of each pair of objects shown in *different* individual styles. In Figure 6, E is shown in both (all) individual styles of the in-group. The vertical part above E thus belongs to the bilateral stylistic root of individual styles s_i and s_j (a). C belongs to individual style i and D to individual style j. Hence, the dashed vertical parts in the common style tree above the node connecting C and D, both individual styles have in common (b). The dashed vertical parts (a) and (b) in the common style tree are the bilateral stylistic root, R_{ji}, of the two individual styles.

This stylistic root must be clearly distinguished from that of evolutionary biology (see footnote 11, chapter 3). There, the root is the single vertical connection of a phylogram to the next higher taxon (for example in Figure 1, right, the dashed vertical connection of length 11 MJ of the phylogram of great apes with Old World apes). The stylistic roots, by contrast, are the commonalities of individual styles within the cultural taxon 'common style', which can be derived from comparability and which manifest in length.

Figure 6: Individuality and proximity in common style.



Obviously, the bilateral root of their individual styles contributes nothing to the bilateral individuality of two consumers. C and D are different, but C and D also *jointly* differ from B and A. For consumer j object C from style s_i is too much like object D from s_j, that D could underpin the individuality of j *vis-a-vis* i with the whole dissimilarity of D and B. Conversely, the same applies to consumer i: C and B are too much like D, for the individuality of i to be underpinned by the whole dissimilarity, *jointly* of C and B *vis-a-vis* A.

Therefore, for determining the individuality of an elective affinity member, j, *vis-a-vis* another one, i, the bilateral stylistic root of their individual styles must be omitted from consideration. This holds true for all other bilateral stylistic roots consumer j shares with any of the other members of their in-group, and hence for the entire stylistic rooting of the consumer's individual style, s_j, in the common style, S, of their in-group.

I am now able to specify social proximity between a member and their in-group. Let R_j^c be the *rooting of the individual style,* s_j*, in the common style,* S, with $R_j^c = \sum_{i=1}^{m} R_{ji}$, where $R_{jj} \equiv 0$. Let the consumer's individuality, I_j, which determines their proximity to their in-group, be

$$I_j \equiv (m-1) \cdot DIV_c^c - R_j^c, \quad j = 1, \dots, m \qquad (1)$$

This definition of individuality is intuitive. Individuality of a member in their in-group as a whole depends on three factors.

First, it depends on the diversity (based on comparability) of all objects in the common style, DIV_c^c. It is the common component of all members' individuality. The more diversity within the common style, DIV_c^c, the greater the individuality of the members of the elective affinity. The less the diversity (based on comparability) of the common style, the less the individuality of members. All the way to the borderline case of zero individuality when diversity within the common style is zero. This borderline case has two variants. Either the common style consists only of a single object, in which case both diversity and the rooting of the individual in the common style, R_j^c, are zero. Or, more generally, the *0/+consumption* of all elective affinities is identical, in which case both terms in (1) have equal values.

Second, individuality depends on the rooting of the individual in the common style, R_j^c. The more the individual style is rooted in the common style (i.e. the greater the anchoring in it, shared with other individual styles), the less individual the individual style is. The less the individual style is rooted in the common style, the more individuality there is.

Third, individuality also depends on the size, m, of the in-group. In the borderline case, $m = 1$, individual j is a loner not belonging to any group. The loner's individuality *vis-a-vis* themself (as being their own in-group) should therefore be zero. For $m = 1, I_j = -R_j^c$. But for $m = 1$ the rooting of the individual in the common style is zero. Hence for $m = 1, I_j = 0$. A loner shows no individuality towards their in-group. A group of at least two makes individuality possible. In a group of two, however, both members possess the same individuality, $I_j = I_i$, because they share identical rooting in their common style, $R_j^c = R_i^c = R_{ji} = R_{ij}$. For $m = 2$, $DIV_c^c \geq I_j = I_i \geq 0$. Individuality of the two sole members of a group is equal to the diversity of the common style they share, if their individual styles possess no bilateral root. For example, this is the case in Figure 6 if the common style, S, is composed of the subset (C, D) and the two individual styles are the subsets $(C)_i$

and $(D)_j$, respectively. Then $R_j^g = R_i^g = 0$. However, their individuality is zero if both show exactly the same objects in their individual style, because then $(m-1) \cdot DIV_c^c = R_j^c = R_i^c$. For $m \geq 2$, $(m-1) \cdot DIV_c^c \geq R_j^c$, and hence $(m-1) \cdot DIV_c^c \geq I_j \geq 0$. Generally, individuality in the in-group takes values between zero and $(m-1)$ times the diversity (based on comparability) of the common style. This is intuitive, too: the consumer, whose individual style does not share any bilateral roots with the other individual styles, gains the $(m-1)$-fold individuality by the $(m-1)$ stylistic contributions of all the other $(m-1)$ in-group members to the common style. In general, the individuality of the consumer grows with each new individual style that is added to the common style. There are two reasons for this: first, the greater number of the other members in the elective affinity, even if they look almost alike. Second, the individuality of all members serves to make the consumer's own individuality all the more visible.

In-group members differ in their individuality, though, if their individual styles have an unequal rooting in the common one. Figure 6 shows that the rooting of individual styles can indeed be different. Suppose that, besides members i and j, the group also includes consumer k, whose individual style consists only of object E – the ascetic variant among the individual styles. Further suppose E is shown by all individual styles in the group. The vertical part (a) is the whole of k's rooting in the common style, whereas i and j share in addition (b) as part of their rooting in the common style. Therefore $R_j^c = R_i^c > R_k^c$, and hence $I_j = I_i < I_k$. An unequal rooting of individual styles in the common style is the source of differences in individuality within an elective affinity. The more different the individual rootings, the more different the individualities within a group; the larger (smaller) the rooting in the common style, the smaller (larger) the individuality. The most extraordinary person within the elective affinity, who stylistically shares the least with the rest, but still just belongs to it, enjoys the greatest individuality.

I can now define social proximity in terms of individuality. Social proximity within an elective affinity is the inverse of a consumer's individuality within it. Let P_j be the social proximity of individual j and its in-group:

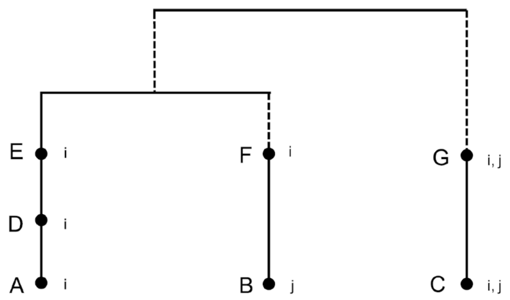
$$P_j \equiv I_j^{-1} \qquad (2)$$

The smaller (larger) the individuality of the consumer within the in-group, the larger (smaller) their proximity to it. This relation represents a schizoid practice in individualised societies: while no one can be without a home in a social group, once in it, the main concern is not disappearing in it.

Dominance Order in Proximity

Orderings such as those in Figure 7 contain objects that relate to one another through the dominance order, $\square_d$. In each feature of the vector, $\underline{m}_j = (m_1, \dots, m_M)$, an object dominates another object from the same chain or is dominated by it.[2*] If a common style contains a dominance order, this must be taken into account when determining diversity, DIV_c^c, and the rooting of the individual style, s_j, in the common style, R_j^c.

Figure 7: Dominance orders in the common style.



Here consisting of two individual styles of two in-group members, i and j.

According to convention, let the supremum of the objects ordered in a chain be positioned at the lower end. The suprema in the common style shown in Figure 7 are objects A, B and C. Object A dominates objects D and E in each feature of the feature vector $\underline{m}_j$, und D dominates E. For example, let A, D and E be three art prints from Gustav Klimt's *femmes fatales* with the strongest expression of 'fatality' in A (for example, Klimt's Judith, 1901) and the weakest in E (for example, Klimt's portrait of Emilie Flöge, 1902). And let B and F be two collections of Louis Armstrong records, with B being more comprehensive than F, and let C and G both be a Borgward Isabella Coupé vintage car from 1955 with C in a more original condition than G.

The diversity, DIV_c^c of a common style, S_1, containing subset (A, B, C) is smaller than the diversity of style S_2, containing (A, B, C, D, E, F, G). For example, if S_1 is enlarged by D to become the subset (A, B, C, D), DIV_c^c increases by the sum of all vertical lengths above A: by the length between A and D (the dissimilarity

2* See footnote 5*, chapter 3, with $\boldsymbol{K}$ as the set of ordinal scales, f_i, of features, m_i, $i = 1, \dots, M$, of the feature vector, $\underline{m}_j = (m_1, \dots, m_M)$.

between D and A) plus the length above D up to their joint node with the vertical branch above B (the dissimilarity between D and B). Adding an additional dominated object, D, to a style increases its diversity, DIV_c^c, by the same value as the supremum, A, by which it is dominated. In general, DIV_c^c of a style, containing dominance orders, $\square_d$, like (A, D, E), (B, F) and (C, G) in Figure 7, can be calculated by multiplying the lengths above each supremum by the number of objects ordered in this dominance order.[3*] This accounts for all bilateral dissimilarities within each dominance order and for the diversity between all dominance orders.

Let $\partial(\mathrm{X}, \square_d)$ be the increase in the number of objects of the common style, by addition of one object to the subset X of dominated objects in the dominance order $\square_d$, (for example by showing the additional object D in the common style (A, B, C) in Figure 7). Then we arrive at:

$$\partial DIV_c^c / \partial(\mathrm{X}, \square_d) > 0 \qquad (3)$$

The diversity (based on comparability) of the common style increases with each additional dominated object shown in it. This can be intuited quite simply: the more varied the individual styles in an in-group through the use of dominated objects – for example, the use of batik scarves in different shades of purple – the greater the diversity of the common style. Obviously, this also holds true if a chain is lengthened by a new supremum, i.e. if the new object now dominates a former supremum.

All that remains is to determine the effect of dominance orders on the rooting of the individual in the common style, R_j^c. In Figure 7 there are two individual styles, s_i showing the objects (A, C, D, E, F, G), and s_j, with the objects (B, C, G). Style s_i exhibits the dominance orders (A, D, E) and (C, G) and s_j exhibits the dominance order (C, G). Expanding two styles that already share one object, for example C in Figure 7, by adding another object, for example G, which is dominated by the first object, has no effect on the bilateral root of these individual styles. But suppose G had been a supremum in both individual styles, which are now augmented by the shared object C. Then their bilateral root R_{ji} and both rootings of their respective individual styles in their common styles, R_i^c and R_j^c, increase by the length between C and G.

The rooting of styles is also affected by dominance orders such as those of (B, F): B belongs to s_j and F to s_i and the one object in one style dominates the other object in the other style. In such cases, the lengths above the dominated

3* Let x_i^{sup} be the supremum of the dominance order $\square_i$, $i = 1, \dots, h$, in which $\#_i^c$ objects are ordered. For $\#_i = 1$ let $x_i^{sup} \equiv x_i$. Let L_i be the total length above x_i^{sup}. Then $DIV_c^c = \sum_{i=1}^{h} \#_i^c \cdot L_i$.

object belong to the bilateral root, R_{ji}, of the two individual styles. For $R_j^c = \sum_{i=1}^{m} R_{ji}$ it follows that, in the presence of dominance orders in the common style, the rootings of the individual styles, s_j, $j = 1, \dots, m$, in the common style of an in-group cannot be smaller than the rootings in the absence of dominated objects. That is:

$$\partial R_j^c / \partial(\mathrm{X}, \square_d) \geq 0 \qquad (4)$$

The rooting of the individual style, s_j, in the common style does not decrease with the enlargement of a dominance order as a subset of the common style.

For (1) it follows that, given (3) and (4), the individuality of in-group member j, I_j, is influenced by two opposite effects when adding an object to a chain. The diversity of the common style increases, which enhances the individuality of all in the elective affinity. But, on the other hand, the rooting of the individual style, s_j, in the common style also increases (or stays constant), which is detrimental to the individuality of j (or lets it remain constant). However:

$$\partial DIV_c^c / \partial(\mathrm{X}, \square_d) \geq \ \partial R_j^c / \partial(\mathrm{X}, \square_d) \geq 0 \qquad (5)$$

The enlargement of a chain in an individual style with an additional object never increases the diversity of the common style by less than it increases the rooting of the individual style it contains. This is because the addition of an object to a chain always increases the diversity (based on comparability) of the common style by the full length above the supremum, whereas the rooting increases by that length at most.

There is now an important relationship to be noted between a dominance order, $(\mathrm{X}, \square_d)$, and individuality within a common style, I_j. From (5) it follows that:

$$\partial I_j / \partial(\mathrm{X}, \square_d) \geq 0, \ j = 1, \dots, m \qquad (6)$$

The enrichment of the common style with additional objects from a dominance order, by showing them in any individual style, either increases the individuality of the members of the elective affinity or it remains constant. Conversely, for proximity within an elective affinity, it follows from (2) that:

$$\partial P_j / \partial(\mathrm{X}, \square_d) \leq 0, \ j = 1, \dots, m \qquad (7)$$

The social proximity within an elective affinity decreases or remains constant when chains are augmented with additional objects.

Distance Clarified

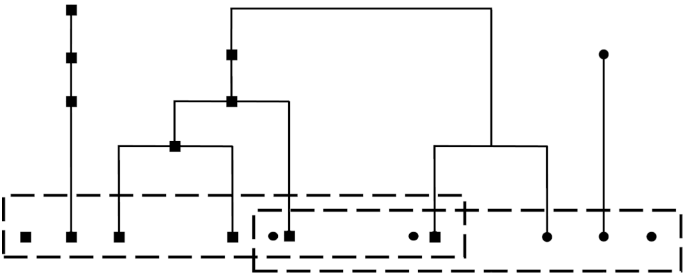
As summarised in Table 6, the common styles of in-groups moderate the social distance between them, i.e. between an in-group and its out-group(s). Distance is what distinguishes different groups despite their similarities. In other words, distance is a measure of what distinguishes the members of one elective affinity as a whole from the members of all other elective affinities.

Everything that makes them comparable clouds the perception of what separates them. Social distance results from the gaze of all in-group members through the meta-contrasting lens, which lets the comparable between the groups disappear and the incomparable appear (Table 5). In the common styles of elective affinities, social distance is extracted from the ordered world of objects, $(X, \square)$, in the form of dissimilarity as incomparability and the diversity based on it, (DIS_{ic}, DIV_{ic}). This also needs to be clarified. Figure 8 serves to illustrate.

Figure 8 is a system of two common styles, S_1 and S_2. Each consists of a subset of chains, branches (of a tree) and singletons, $\{\circ, |, \pitchfork\}$. As elaborated in chapter 3, dissimilarity as incomparability and diversity based on incomparability are not based on the vertical structure of ordered subsets, but on their *horizontal structure*. From this horizontal structure, antichains, $\sqsubset\sqsupset$, can be extracted that only contain information on incomparabilities because they are totally dissimilar subsets (see footnote 19*, chapter 3). There are different ways of forming antichains. In the following, the subset of suprema, i.e. of the undominated objects, is defined as the antichain, $\sqsubset\sqsupset_h$, of the common style S_h.[4] In Figure 8, the antichains of the undominated objects of the two common styles, $\sqsubset\sqsupset_1$ and $\sqsubset\sqsupset_2$, are marked by the two perforated boxes. Obviously, all singletons of a common style are elements of this antichain, as are, by convention, the lowermost elements (suprema) in its chains. Conversely, no object dominated in a dominance order, $\square_d$, belongs to it.

4 Basili and Vannucci 2013.

Figure 8: Nucleus and periphery of two common styles $\boldsymbol{S_1}$ *and* $\boldsymbol{S_2}$.



S_1 shows ■ objects and S_2 shows • objects. The two perforated boxes contain the antichains of the suprema of the styles S_1 (left) und S_2 (right). The intersection of the two antichains is the shared periphery of the two common styles. The nucleus of a common style is its antichain less its periphery.

Diversity based on incomparability of the common style S_h, DIV_{ic}^h, is the cardinality, $\#_h$, of the antichain $\sqsubset\sqsupset_h$, $DIV_{ic}^h = \# (\sqsubset\sqsupset_h)$. It is obtained by counting the elements in the antichain. For example, in Figure 8 $DIV_{ic}^1 = 6$ und $DIV_{ic}^2 = 5$. The first style has a greater number of incomparable objects than the second and is therefore more diverse in this sense.

However, social distance is not the result of incomparability within a common style, but of incomparability between styles. Here we have a complication to consider because, in practice, different common styles are not disjunct sets. They can contain objects that are also displayed in one or more other common styles. For example, the banker style, the 'smart casual' style of the venture capitalist and the professional creative style can all display the *blucher* as a shoe. In Figure 8, the elements within the intersection of the two perforated boxes belong to both styles. Needless to say, shared elements of two common styles cannot contribute to their incomparability, even if they are incomparable within the respective styles.

This leads to the distinction between *style periphery* and *style nucleus*, from which a simple definition of dissimilarity as incomparability can be derived. Let P_{hk} be the style periphery of two common styles, S_h and S_k, with $P_{hk} \equiv \sqsubset\sqsupset_h \cap \sqsubset\sqsupset_k$, defined as the intersection of the antichains of both styles. The style nucleus, N_{hk}, of style S_h is the subset of its antichain that does not also belong to the antichain of the other style. Then $N_{hk} \equiv \sqsubset\sqsupset_h \backslash \sqsubset\sqsupset_h \cap \sqsubset\sqsupset_k$ and $N_{kh} \equiv \sqsubset\sqsupset_k \backslash \sqsubset\sqsupset_k \cap \sqsubset\sqsupset_h$.

Let the dissimilarity as incomparability of two common styles be the sum of the cardinalities of both their nuclei, that is $DIS_{ic}^{hk} \equiv \# (N_{hk} \uplus N_{kh})$, that is, the sum of the union of the disjunct sets N_{hk} and N_{kh}. Also, $DIS_{ic}^{hh} = \# \,(N_{hh} \uplus N_{hh}) = 0$. The dissimilarity as incomparability of a common style with itself is zero, because the nucleus of the common style compared to itself is an empty set. For example, in Figure 8, $DIS_{ic}^{1,2}$=7. The dissimilarity as incomparability of two common styles is simply the sum of the elements of their two style nuclei, that is, of those elements of their antichains that are not also shown by the other style.

The social distance between elective affinity h and all other $n-1$ elective affinities (that is, the distance to the social whole), can now be defined as the sum of the bilateral dissimilarities of style S_h with every other style S_k, $k = 1, \ldots n, k \neq h$. Let D_h be the social distance between the elective affinity h and all other elective affinities:

$$D_h \equiv \sum_{k=1}^{n} DIS_{ic}^{hk} = \sum_{k=1}^{n} \# \,(N_{hk} \uplus N_{kh}) \qquad (8)$$

The social distance between elective affinity h and all other $(n-1)$ elective affinities is the sum of the objects in the n stylistic nuclei of the style system, containing n common styles, in *each* case related to the common style S_h. That is, in a style system with n common styles there exist $n \times n$ style nuclei (with the principal diagonal consisting of empty sets), because the style nucleus is defined relative to another common style.

This is not the only possible definition of social distance. An alternative would be to interpret the nucleus of a style *vis-à-vis* the *union* of all other antichains, $\sqsubset\sqsupset_{-h}$, with $\sqsubset\sqsupset_{-h} = \sqsubset\sqsupset_1 \cup \ldots \cup \sqsubset\sqsupset_{h-1} \cup \sqsubset\sqsupset_{h+1} \ldots \cup \sqsubset\sqsupset_n$, and define the nucleus of a style by $N_h \equiv \sqsubset\sqsupset_h \setminus \sqsubset\sqsupset_{-h}$. Then the number of nuclei in the style system is equal to the number of common styles and the distance, D_h^*, between the elective affinity h and the social whole is:

$$D_h^* \equiv \sum_{k=1}^{n} \# \, N_k$$

Then $D_h^* = D_k^*$ for all h and k, that is, all elective affinities are always at an equal distance from each other.

In the D_h^* interpretation of social distance, the mohawk hairdo of punk is part of the style nucleus of punk if and only if it is not shown in any other common style of the whole style system of society. But if a single goth follower shows up with this hairdo, the mohawk hairdo is banned from the style nucleus of punk and contributes nothing to its social distance to any other elective affinity. Only those objects from the antichain of a common style moderate social distance D_h^*, that are not found in any other style.

In the following, social distance is defined as in formula (8), because D_h has two advantages compared to D_h^*. The first is that the social distance to the social whole can vary from elective affinity to elective affinity, whereas in the D_h^* interpretation, all elective affinities are always equally distanced from the whole. The second advantage is that, in the D_h^* interpretation, the social distance disappears altogether if all objects from all antichains exist in at least one other antichain. This is because, in the D_h^* interpretation, there always exist, implicitly, only two relevant groups: we (the in-group) and the rest! Conversely, the D_h interpretation allows for a richer social structure, because the social distance that a group maintains *vis-à-vis* the social whole is made up of the (different) bilateral distances that it maintains *vis-à-vis* the different groups of the social whole.

A special case from (8) is worth noting. In a style system free of bilateral peripheries, i.e. where P_{hk}=0, $h \neq k$ for all antichains:

$$D_h \equiv \sum_{k=1}^{n} \# \left(\sqsubset\sqsupset_k\right) \qquad (8')$$

With no bilateral stylistic peripheries, the distance maintained by an elective affinity to the social whole is equal to the number of objects in all the antichains of the style system. But without stylistic peripheries, it is also true that $N_{hk} = \sqsubset\sqsupset_h$, $h, k = 1, \ldots, m$, and therefore $D_h = D_h^*$. This means the social distance is the same for all groups, just as when individuals only distinguish between the in-group and the rest. Hence, it is not the style nucleus but the style periphery that causes differences in social distance between elective affinities. In other words, it is precisely what two common styles share, not what separates them, that creates the difference.

The reason is this: if bilateral differences account for the sharing of distance, only bilateral sharing can create differences. However, since shared distance is at a minimum always something bilateral, bilateral sharing can only bring about differences *vis-à-vis* third parties. The shared periphery of S_h and S_k shortens the bilateral distance of their elective affinities, but it can contain more or less objects than the common periphery of styles S_h and S_i. However, via its antichain, each style contributes the same number of objects to every bilateral distance it is a party to. Therefore, only differences in the peripheries in the entirety of all bilateral stylistic relationships can cause differences in the social distance between single groups and the social whole. This is why what is shared bilaterally creates group-specific differences *vis-à-vis* the social whole.

This also explains why, in a style system that consists of only two elective affinities, it is always true (i.e. with or without a stylistic periphery) that $D_h = D_h^*$

from (8) and (8'). For $n = 2$, by definition, the shared periphery of the two styles is the periphery of each of them with all others.

Style Nucleus and Periphery in the Social Whole

Addressing an issue in game theory in a meaningful way, you have to assume a minimum of two economic agents – game theory's minimum society consists of two members. In *style theory* there is a minimum of six: two individuals, each with their individual styles, to deal with issues of social proximity/individuality, in a total of three common styles, to deal with issues of social distance. In this sense, the 'style society' is more complex than the 'game society' that is so highly developed in economics.

Let $\partial \# N_{hk}$ be the increase in the number of objects of the common style S_h by enlarging its nucleus by one more object. Let $\partial \# N_{kh}$ be defined as such an increase in style S_k. From (8) it follows that:

$$\partial D_h / \partial \# N_{hk} = \partial D_h / \partial \# N_{kh} > 0 \qquad (9)$$

The distance between elective affinity h and the social whole increases when adding another object to any style nucleus of the style system.

Let $\partial \# P_{hk}$ be the increase in the number of objects of common style S_h by enlarging the periphery, which it shares with style S_k, by another object. Then $\partial DIS_{ic}^{hk} / \partial \# P_{hk} = 0$. That is, the dissimilarity between styles S_h and S_k is not changed by the newly shared object. Let this additional object not be an element of the other $(n-2)$ antichains in the style system. Then from (8) it follows for $n \geq 3$ that:

$$\partial D_h / \partial \# P_{hk} = \partial D_k / \partial \# P_{hk} > 0 \text{ and } \partial D_i / \partial \# P_{hk} > 0 \text{ for all } i \neq h, k \qquad (10)$$

A new object in a style periphery that was not previously part of *any* antichain of the style system increases the social distance between *every* elective affinity and the social whole, which consists of at least three elective affinities. Here, our intuition tells us that, *vis-à-vis* all *other* elective affinities, the new object augments the style nucleus of S_h and S_k and hence the social distance between each of them and every other elective affinity i.

Let $\partial \#\sqsubset\sqsupset_h$ be defined as the increase in the number of objects of the common style S_h by augmenting its antichain by one more object, and let it not be an element of the other $(n-1)$ antichains in the style system. Then it follows from (9) and (10) for $n \geq 2$ that:

$$\partial D_i / \partial \ \sharp\sqsubset\sqsupset_h > 0, i = 1, \ldots, n \qquad (11)$$

The distance of any elective affinity to the social whole increases when a new object, that did not previously belong to any antichain of the style system, is added to an antichain. This can also be easily intuited, based on what has been said so far.

The distance to the social whole of *existing* elective affinities is not affected by an increase in the number of common styles in the style system, if the total number of objects in the style nuclei remains constant. From the example in Figure 8, it follows that $D_1 = D_2 = 7$. Now, if a new style S_3 is produced by splitting off the singleton and the single chain on the left side from style S_1, such that only S_3 shows this singleton and chain, the number of objects in the style nuclei of the style system remains constant and therefore $D_1 = D_2 = 7$. This form of stylistic diversification has no effect on the social distance between the former elective affinities and the (now larger) social whole. But the social distance between the newly added style and the social whole is no larger than that of the former elective affinities, only if, in the case of (8'), there are no peripheries shared between the former styles. If there is at least one style periphery in the former style system with n styles, then the social distance between the new style, S_{n+1}, and the social whole, D_{n+1}, is larger than that of the former styles. In the example in Figure 8 containing a shared periphery of S_1 and S_2, it follows, for example, that $D_{n+1} \equiv D_3 = 11 > D_1 = D_2 = 7$. This form of stylistic diversification results in a distance between the new elective affinity and the social whole that is larger than that of the former elective affinities, because the new style is not burdened with a style periphery. As a result, the antichains of all former styles contribute fully to the formation of social distance for the new elective affinity.

These observations highlight the fact that an object from the antichain of a style makes no universal contribution to social distance in the style system; that is to say, no contribution independent of the internal structure of the style system. This is the case even though the distance to the social whole is based on the simple counting of elements found in the antichains of common styles. The principle of 'one object one count' does not apply. The contribution of each and every object from the antichains of common styles to the social distance within society is dependent on whether the object is shown in several styles or only in one. If it is shown in several styles, a shared periphery of otherwise different styles is born or augmented. Peripheries, however, diminish the distancing potential of the antichains and, in this sense, are cultural wastefulness. Only objects from the style nuclei develop the maximum distancing potential of incomparable objects.

Let $\emptyset D$ be the average distance between styles and the social whole. From (8), we arrive at $\emptyset D = \sum_{h=1}^{n}(\sum_{k=1}^{n} \# \ (N_{hk} \uplus N_{kh}))/n$, and from (8'), for a style system without peripheries, it holds true that $\emptyset D \equiv \emptyset D' = \sum_{k=1}^{n} \# \ (\sqsubset\sqsupset_k)$. For a fixed total number of objects in the antichains of the style system, $\#'$, $\#' \equiv \sum_{k=1}^{n} \# \ (\sqsubset\sqsupset_k)$, we arrive at:

$$D'(\#') \geq \emptyset D(\#') \qquad (12)$$

with strict inequality if, in (8), $N_{hk} \subset \sqsubset\sqsupset_h$ holds true for at least one pair of common styles. For a given total number of objects in the antichains, the average distance *vis-à-vis* the social whole is smaller in the presence of stylistic peripheries than their absence. But then, given a total number of objects in the antichains of the style system, stylistic peripheries are culturally inefficient if one is pursuing the goal of maximum average distance *vis-à-vis* the social whole. In this sense, only the objects in the style nuclei are efficiently allocated in the style system.

However, as already mentioned in the previous section, this does not imply that stylistic peripheries are ineffective. They are the sole source of differences between styles in terms of their distance *vis-à-vis* the social whole. It is now possible to formulate the objective function of the *o/+consumer*.

Objective Function in the Social

In the orthodoxy, consumer utility, U_i, is a function of the *quantities*, q, of v goods that consumer i buys:

$$U_i = V(q_1, \ldots, q_v)$$

Apart from pathologies/anomalies, the orthodox motto is 'the more of everything, the better!' Style as a property of ensembles of goods can be accounted for in this orthodox *quantity* theory of consumption with reference to the concept of complementarity between goods of one common style, and substitutability between goods of different common styles. However, this is true in principle only! Because for as long as they are lacking in cultural substance, the ideas of (economic) complementarity and (economic) substitutability will remain a shell devoid of content. Only the crudest predictions can be made – not to mention Max

Weber's insistence that social phenomena must not only be predicted but also understood. That is where QTC steps in and sets itself apart from the orthodoxy.

Just as the orthodoxy abstracts from qualities, so I have abstracted from quantities when expanding on the idea of *0/+consumption*. This idea compels a radical departure from the orthodoxy. Because in the *0/+consumption* approach, even those goods that consumers never buy provide utility. It is only consequential then to abstract entirely from the controlling function of prices and the household budget, which are so central to the orthodoxy. This allows the effects of the quality of goods to be isolated in their purest form. QTC is therefore an economic theory devoid of money.

In the second step of my argumentation I have specified exactly what can be consumed in *0/+consumption* with the things and behaviours that are shown and not shown: it is differences that can be consumed; differences between people and between groups of people. These differences are entirely due to *0/+consumption* – with no money involved. This makes *0/+consumption* the constitutive foundation of the social realm, as the aggregate of individual differences – with no money involved. In this way, QTC also becomes an economic theory of sociological postmodernism, of a society in which the social structure is neither stratified nor predetermined by the differences in human endowment. Rather, it is an economic theory of the horizontal structure of elective affinities that is produced by *0/+consumption* – with no money involved.

A simple formulation of the effect of this social embeddedness on happiness/utility of an individual is:

$$U_i = U(Distance, Proximity) \equiv U(D_h, P_i^{-1}) = U(D_h, I_i)$$

That is, happiness/utility is a function of collective existence as part of an elective affinity within the system of all elective affinities (distance *vis-à-vis* other groups) and of one's individual existence within this elective affinity (individuality as the inverse of proximity to the other members of the elective affinity).

In the penultimate step towards identifying the relationship between *0/+ consumption* and the happiness/utility of the individual, social distance and proximity were operationalised. The starting point for this operationalisation was the assumption that suitable specifications of social distance and proximity must be based on the basic idea of individual dissimilarities between any two people. But there are (at least) two fundamentally different basic ideas for this purpose: dissimilarity as comparability, DIS_c, and dissimilarity as incomparability, DIS_{ic}, and, building on this, two corresponding ideas of diversity for groups with more than two members, DIV_c and DIV_{ic}. An assignment of these alternative ideas to the different social contexts – in-groups and out-groups (Table 6) – leads to the following clarification of the objective function:

$$U_i = U[D_h(DIS_{ic}, DIV_{ic}), I_i(DIS_c, DIV_c)]$$

Up to this point, human happiness/utility is a function of precise but abstract dissimilarities and/or diversities. What they refer to is still completely up in the air. Happiness/utility still needs to be grounded in the world of objects, as it shows up in the observable individual and common styles, through which (wordless) communication takes place. For this final step we can look to the results of the present chapter.

Let individual i with its individual style, s_i, be a member of the elective affinity h, showing the common style, S_h. From (1) and (8) it follows that:

$$U_i = U(D_h, I_i) = U[\sum_{k=1}^{n} \# \, (N_{hk} \uplus N_{kh}), (m-1) \cdot DIV_c^c - R_i^c] \qquad (13)$$

The consumer's happiness/utility is a function of properties of their individual style and the common style of their elective affinity, in which their individual style is nested, as well as of the entire style system of all elective affinities in society.

Specifying the utility function as in (13) allows for the following traditional assumptions of the orthodoxy to be maintained *mutatis mutandis*:

$$\partial U_i/\partial D_h > 0, \partial U_i/\partial I_i > 0, \partial^2 U_i/\partial D_h^2 < 0 \text{ und } \partial^2 U_i/\partial I_i^2 < 0 \qquad (14)$$

That is, positive but decreasing marginal utility of the distance between the elective affinity and the social whole, and positive but decreasing marginal utility of the individuality of the consumer in their elective affinity.

The concrete specification of the determinants of happiness/utility, is at all times influenced by culture as 'crystallised history', □, which forms out of the world of objects that ordered set, (X, □), that allows the *0/+consumption* of all individuals to become collectively effective. In other words, with their *0/+consumption*, the consumer can manipulate but not control the determinants of their individual happiness/utility.

Psychology of the Objective Function

It is time to position QTC within the psychology of the self. QTC addresses the collective production of the self through *0/+consumption*. Consumption results in a multiple social identity: collective identity in an elective affinity (brought about by the common style), and individual identity within the elective affinity (brought about by the individual style). They are interdependent. The common style is composed of individual styles and the individual style allows for greater individuality the more diverse the common style is. QTC is thus also a theory of human identity.

As a theory of identity, there are three touchpoints with social psychology: *identity theory*, *social identity theory*, and *self-categorisation theory*. Social identity theory and self-categorisation theory are more closely related and are sometimes treated as one (social-identity-cum-self-categorisation theory). Whether the commonalities between identity theory and social-identity-cum-self-categorisation theory outweigh their differences remains an open question.[5] The question of whether QTC belongs to one of these theories is therefore a matter of degree. However, social identity theory and self-categorisation theory are themselves dissimilar enough to distinguish in them two separate strands of research.[6]

Identity theory has little in common with QTC, as its origins lie not in psychology but in modernist sociology. Its main concern is identity born out of role-playing in a given social structure. It asks what identity emerges when people slip into the role assigned to them by society.[7] It is concerned with *what one does* in order to fulfil these expectations, which is why freedom of choice is negligible here.

Both social identity theory (SIT) and self-categorisation theory (SCT) have their roots in psychology. Their main concern is the identity that results from membership in (social) groups. Accordingly, they are concerned with *who a person is* when they join a social group (SCT) or when they happen to find themself in it (SIT). Choice is a prominent issue in both approaches. There are commonalities between them and QTC, but there are also differences that need to be clarified now.

The origin of SIT is the *minimal group paradigm* from a famous experiment. Subjects who believe themselves to belong to an in-group, which is in fact completely meaningless, start to prefer individuals (over an out-group) who they also

5 Hogg, Terry and White 1995; Stets and Burke 2000.

6 Hornsey 2008.

7 Hogg, Terry and White 1995.

believe to belong to this in-group. The minimal group that has social impact is thus the one that individuals simply believe they belong to.[8] This led to the socio-psychological theory of intergroup behaviour, the demarcation of and preference for one's own group over others. The 'distance' argument in the objective function (13) represents this basic hypothesis of SIT. For a member of an in-group, it turns separation from out-groups into a value in itself. SIT leaves the question mostly open, however, as to how this separation is achieved. QTC steps in here, proposing operationalisation of this separation by means of diversity theory's concept of width. It stresses the incomparability of common styles as that which is significant for separation.

SCT is an outflow from SIT.[9] It distinguishes three levels of belonging: the uppermost level of *human identity*, the middle level of belonging to an in-group (*collective identity*) and the bottom level of self-categorisation based on interpersonal comparisons (*personal identity*). Individuality, then, is the result of these interpersonal comparisons. The 'individuality' argument in the objective function (13), defined as the inverse of the individual's 'proximity' to the in-group, represents this basic hypothesis of the SCT. It allows individuality as interpersonal differentiation to become a value in itself for the individual. SCT leaves open the question of who the object of this interpersonal differentiation is. QTC defines the members of the in-group as the reference group for that comparison. Alternatively, it could be the out-groups, or both. Plausibility considerations favour the in-group: the potential for physical proximity, the significance of the in-group compared to other social groups and thereby the significance of its members *vis-à-vis* society as a whole, the frequency of resonance. Furthermore, SCT also leaves open the question as to what the aspirational personal identity consists of. Operationalisation as (part of) the (diversity theoretical) length of the common style is QTC's proposal for precisely what individuality could consist of. It emphasises what is different but comparable between the individual styles of the in-group – as that which constitutes individuality. The *personal* identity of SCT corresponds to the *individual* identity in QTC, although, in the latter, it is more precisely specified.

Early on, SIT and SCT regarded collective and personal identity as antagonistic. SIT distanced itself from the more individualistic approach of the SCT, arguing that collective identity is the primary basis for the definition of identity, and that group behaviour could not be derived from individual behaviour. From that viewpoint, SCT, with its openness to individual choice, is a more natural

8 Tajfel, Billig, Bundy and Flament 1971.

9 Turner, Hogg, Oakes, Reicher and Wetherell 1987.

touchpoint for economics than SIT. However, the orthodoxy with its *Identity Economics* remains ambivalent towards both theories.[10] On the one hand, in *Identity Economics*, group membership is generally understood to be the resource-dependent result of individual decisions (cf. SCT). On the other hand, its assumption of group-specific exogenous preferences leads to exogenous collective behaviour (cf. SIT). By contrast, the objective function (13) has been developed out of a special model of social circumstances (postmodernism), as a goal that is appropriate to these circumstances and to emic meaning. Thus, the objective function is generally a societal variable and not a function exogenous to it. It is fed by the social whole (modernism, postmodernism, etc.) and, thereby, determines the social realm in its smaller spheres (within and between groups).

Over time, SIT and SCT have moved closer together in their efforts to respond in a more nuanced way to the human desire for individuality and, at the same time, for group belonging (multi-identity motivation).[11] Today, psychologists do not even shy away from postulating an optimal internal balance between the separate subgoals of collective belonging – the *we!* – and individuality – the *me!*.[12] Experimental consumer research has shown, for example, that consumers indeed simultaneously demonstrate multi-identity motives through their choice of an object, such as the motive of belonging through their choice of *brand* and the motive of individuality through their choice of *colour*.[13] A business model based on this psychology is the 'singularity mass production' of brands such as Nike, where customers can design their 'one-offs' in Nike's internet configurator. Another business model based on multi-identity psychology aims at balancing experimentation (striving for individuality) and risk avoidance (avoiding social exclusion).[14] In QTC, too, the simultaneous striving for individuality and group belonging is no contradiction. The objective function (13) is an operationalisation of this simultaneous striving.

The self-categorisation of SCT includes as one of several dimensions the perceived 'goodness of fit'.[15] It is operationalised in the objective function (13) in its 'proximity' argument as diversity based on comparability. QTC thus abstracts from SCT's other dimensions of personal identity, such as emotional involvement, social embeddedness in daily interaction, ideology and narration.

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10 Akerlof and Kranton 2000.

11 Hornsey 2008, p. 216.

12 Brewer 1991.

13 Chan, Berger and Van Boven 2012.

14 Holzer 2013.

15 Ashmore, Deaux and McLaughlin-Volpe 2004.

In QTC, 'fit' also determines collective identity. But not as 'goodness of fit', but as 'badness of fit' – operationalised as dissimilarity-as-incomparability. In this respect, QTC differs from SIT, which operationalises the relationships between groups in behavioural dimensions such as out-group discrimination and in-group favouritism. Thus, in QTC, 'fit' as the result of clustering in the sorting plant of culture determines, in different definitions, both the individual and the collective identity. These different definitions are given by the meta-contrasting lens through which individuals see themselves within their in-group and, respectively, their in-group versus out-groups (see Table 5). This is also part of the tradition of SIT and SCT, where the salience of the personal from the collective identity is understood as being contextually activated.[16]

The basic premise of QTC is symbolic interaction, which allows identity to emerge collectively. The means of symbolic interaction is *0/+consumption* as an individual and collective subset within the world of objects. The mutually understood 'language' of the world of objects is the crux of this interaction. QTC thus is also aligned with the tradition of Russel Belk's influential concept of the *extended self*, according to which identity, both in terms of self-image and outside perception, is also inherent in material things.[17] From this viewpoint, people interact with objects not in terms of their material functionalities, but the meaning they convey.[18] The world of objects is not limited to the purely material, behaviour also creates identity. Here, the arguments of QTC's objective function (13) align with the multidimensionality tradition of SCT's self-categorisation.[19]

It is well worth comparing QTC with a formal SIT/SCT model.[20] Moses Shayo's model of identification and identity can be described in his chosen application as follows. Individuals differ in their exogenous endowments, including income and wealth (1). Three exogenous groups are given: the poor and the rich (class), and the nation (2). In their self-categorisation, individuals can assign themselves either to one of the two classes or to the nation (3). The utility resulting from this identity depends on two factors. The first is the utility of the identity, which the group, chosen via self-categorisation, provides; among classes, the class of the rich provides greater utility than that of the poor (4). The second is the proximity to the prototype of the chosen group (5). The smaller the differences between the individual and the prototype (for example in terms of income),

16 Hornsey 2008, p. 208; Howard 2000, p. 369; Stets and Burke 2000, p. 224.

17 Belk 1988.

18 Howard 2000, p. 371.

19 Ashmore, Deaux and McLaughlin-Volpe 2004, p. 83.

20 Shayo 2009.

the greater the utility (6). In their self-categorisation, individuals choose the group that offers the greatest utility – for the poor, this can be the nation and not their class. Individuals take part in political elections only after their self-categorisation (7). In these elections, those poor individuals who have chosen their class show limited altruism (8) by voting for redistribution, which those poor individuals who see themselves as belonging to the nation do to a lesser degree. Thus, the model predicts that redistribution is lower in countries where the nation is held high than in countries whose citizens feel more strongly attached to their class than to their nation.

Whereas in Shayo's model exogenous endowment determines which group an individual will join (1), in QTC the endowment has no influence on group membership. Only the *0/+consumption* of individuals determines group membership. Self-categorisation is thus not based on a comparison of exogenous endowments, as in the Shayo model, but on a comparison of endogenous consumer behaviour.

The most important difference between the two models is the exogeneity of social groups in Shayo (2) and their endogeneity in QTC. In Shayo's model, groups *exist* (as categories) before people categorise themselves. In QTC, groups *become* by virtue of people joining them in the sorting plant of culture.

With Shayo, self-categorisation is unconditional (3), it is a purely mental act. Since, in QTC, *0/+consumption* determines assignment to a group, groups are only formed by consuming. Self-categorisation is thus not a mental but an economic act. This implies that consumption does not directly contribute to happiness/utility but does so by allowing for self-categorisation.

Both models operate with the happiness/utility provided by the selected in-group (4). In QTC, it is created by the distance of the in-group to the social whole, which is operationalised as width (diversity based on incomparability). Width is collectively created by all groups acting together, and therefore the groups are interdependent in terms of the happiness/utility they jointly create. What's good for one group is good for all. In Shayo's model, however, there is no systematic relationship between the utilities that membership in different social groups confers on their respective members.

In both models, proximity within the in-group also brings about happiness/utility (5). In Shayo's model it is the proximity to the prototype and thus to a (constructed) individual at the centre of the in-group. Proximity results from comparing the exogenous endowment of the individual with the exogenous endowment of the prototype. In contrast, in QTC, proximity to the in-group results from the comparison with all other group members, operationalised as diversity theory's concept of length (diversity based on comparability). And whilst proximity is defined by way of example of the prototype in Shayo's model, this does not apply to QTC, where differences to all are what counts.

In Shayo's model, utility increases with increasing proximity to the prototype (6). This implicitly models a collectivist society – the individual wishes to merge with it, to be absorbed into it. In contrast, QTC models the individualist. They, too, want social belonging but seek individuality within it. This is why happiness/utility decreases when the proximity of the individual to its in-group increases. All group members strive for the greatest possible individuality within the group, yet without losing their membership.

The two models also differ in terms of the timing of action (7). In QTC, action is the starting point for finding identity; in Shayo's model, action (e.g. at the ballot box) is the result of the chosen identity. Thus, in QTC, action in the form of *0/+consumption* constitutes identity. In Shayo's model, action is the opportunistic outflow of a pre-determined identity.

Shayo's model allows for parochial altruism in favour of the in-group, not as a goal *per se* but as a result of self-interest (8). The class-conscious poor vote for redistribution, because rising class income (not just personal income) raises class status. QTC accommodates unlimited altruism, likewise not as a goal but as the result of individual action. This aspect of QTC needs to be further clarified.

Egoism/Altruism Obsolescence

The objective function (13) brings two present-day phenomena to the fore: egoism of the individual combined with indifference towards others on the one hand, and on the other hand a society in which the gain of the individual, their happiness/utility, is a gift from the social whole. Here is a paradox of QTC: individuals work at the social (solely) for themselves, and yet they receive everything of value to them as a gift from the social whole.

Objective function (13) is fully contained in the orthodoxy's tradition of methodical individualism. All striving has its origin in the individual, everything of value is expressed as the individual's advantage. There is not a spark of public welfare motivation in the objective function (13). Individual striving is not even aimed at the fulfilment of the volition of other individuals (altruism), not even at that of one's own elective affinity (parochial altruism). The individual works on the social for themself alone. Nevertheless, alone, the individual achieves (almost) nothing. Its happiness/utility is (almost) entirely produced collectively. The *0/+consumption* as the single control variable of the individual is not an argument of objective function (13). Not even the individual style that emerged from it appears in the concept of objective function (13) as a determinant of happiness/utility. The individual style of the egoist influences their goal attainment only indirectly, through their contribution to the common style of the elective affinity and to the style system consisting of all elective affinities in society.

Consider the contribution of the individual style to the happiness/utility of the average egoist in Table 10. Its contribution to the common style of its elective affinity of m egoists is $1/m$. The common style is the 'club good' of the elective affinity. Given the minimum group size of $m = 2$, the maximum possible contribution of the individual style to the club good is 1/2 and the contribution of the $(m - 1)$ other club members is at least 1/2. The larger the elective affinity, the smaller the individual contribution.

Suppose there are n elective affinities in the style system. Then the contribution of the individual style of the average egoist to the contribution of the average elective affinity to the style system of society is $1/m \cdot n$. The style system is the 'collective good' of society. Suppose society consists of z (style-capable) individuals. Then $m \cdot n = z$, and the average contribution of the egoist to the whole style system is $1/z$. The larger the number of style-capable members in society, the smaller their individual contribution to the style system.

Table 10: Average individual contribution (Ø) of the egoist to the determinants of their happiness.

Determinants of the Objective Function			
Term in the objective function (13)	*Characterisation*	*Source*	*Agency level*
$\sum_{k=1}^{m} \# (N_{hk} \uplus N_{kh})$	stylistic nuclei of all common styles	style system (collective good with $\emptyset = 1/z$)	society
(ditto)	(indirectly: the bilateral stylistic peripheries of the common styles)	style system (collective good with $\emptyset = 1/z$)	society
m	In-group size	style system (collective good with $\emptyset = 1/z$), and common style (club goods with $\emptyset = 1/m$)	society/ elective affinity
DIV_c^c	diversity based on comparability of the common style of one's own elective affinity	common style (club goods with $\emptyset = 1/m$)	elective affinity
R_i^c	rooting of the individual in the common style	common style (club goods with $\emptyset = 1/m$)	elective affinity

m: number of members of an elective affinity; z: number of style-capable members in society.

Table 10 shows the social scaling expressed in formula (13). Although the egoist is doing everything just for themself, they only contribute a minor part to their own advantage. They owe the majority of it to a grander collective, to the elective affinity as a whole and to society as a whole. The bigger the collective, the smaller their own contribution to their individual advantage. Consumption is a collective activity and the individual advantage is a gift from the social whole.

The objective function (13) not only expresses altruism-free egoism, but also extreme individualism. The individual not only attempts to distinguish themself as part of a group from other groups, but also to distinguish themself as an individual within the group from other group members. If the pursuit of individuality were missing, the objective function could be simplified to

$$U_i = U(DIV) \qquad (15)$$

with *DIV* as a measure of the diversity of the entire style system. Objective function (15) expresses pure joy in the diversity in society and thus an appreciation of each other, including everyone's individual contribution to the joy of all. In the objective function (13) a different approach comes into play: indifference towards third parties instead of appreciation.

The paradox inherent in the objective function (13) lies in the fact that even the consumer who disrespects all other members of society and pursues only their self-interest receives (almost) everything they value as a gift from the social whole; and (almost) everything they do purely for themself is actually their gift to all the rest. Pure egoism and total altruism lead to the same happiness/utility for all. With the objective function (13), the concepts of egoism and altruism lose their predictive power.

Poststructuralism of the Objective Function

Poststructuralist Jean Baudrillard begins his early work *La société de consommation* with the following words:

> "There is all around us today a kind of fantastic conspicuousness of consumption and abundance, constituted by the multiplication of objects, services and material goods, and this represents something of a fundamental mutation in the ecology of the human species. Strictly speaking, the humans of the age of affluence are surrounded not so much by other human beings, as they were in all previous ages, but by *objects*. Their daily dealings are now not so much with their fellow men but rather, on a rising statistical curve, with the reception and manipulation of goods and messages." [21]

In his introduction to the English translation of *La société*, George Ritzer describes the essence of this work with words that recall QTC. [22]

> "The world of consumption is treated like a mode of discourse, a language [...]. As a language, consumption is a way in which we converse and communicate with one another."

QTC interprets, or rather defines *0/+consumption* as the language with which people speak to each other.

21 Baudrillard 2009 (1970) (emphasis in original).

22 ibid., p. 6–9, 15.

> "[C]onsumables become sign-values."

In QTC, individual consumer goods do not become signs, each performing for its own sake, but as goods type baskets, individual styles (from *0/+consumption*) become the syntax of their communication. The value of *0/+consumption* is its language-equivalent capacity.

> "When looked at from the structural perspective, what we consume are signs (messages, images) rather than commodities."

QTC is precise about whose signs the individual consumes. It is both the signs that it sets itself and, without qualification, the signs that are set by everybody else. The individual thus consumes the entire communication from the style system.

> "This means that consumers need to be able to 'read' the system of consumption in order to know what to consume."

In QTC, it is a prerequisite that everyone comprehends culture's instructions for its sorting plant, that is, that everyone belongs to the same culture. Only then can they recognise the effect of an additional concrete object on social distance and proximity and make their own choice.

> "Commodities are no longer defined by their use, but rather by what they signify. And what they signify is defined not by what they do, but by the relationship to the entire system of commodities and signs."

This emphasises what leads to the obsolescence of egoism/altruism in QTC. The individual does not consume what is provided by the single object it shows, but what it provides in conjunction with all other objects in the style system; the benefit to the individual, its happiness/utility, is a gift from the social whole.

> "There is an infinite range of difference available in this system and people therefore are never able to satisfy their need for commodities, for difference."

Here, Baudrillard's concept of the fundamental mutation of the human species is further clarified – it is no longer goods that are consumed, but differences between people, which manifest themselves in differences in consumption. This is the fundamental paradigm of QTC.

> "Baudrillard urges the abandonment of the 'individual logic of satisfaction' (need and so on) and a central focus on the 'social logic of differentiation'."

QTC responds to Baudrillard's urge for a new logic by specifying the social logic of differentiation – it is collective social distance and individual proximity that are consumed, which shows up in *0/+consumption*.

> "What people seek in consumption is not so much a particular object as difference and the search for the latter is unending."

Neither poststructuralist consumption nor *0/+consumption* leads to saturation. In both, there are no differences between people that could not be replaced by even greater differences, thus further increasing happiness/utility. For Baudrillard, this leads to the "fantastic conspicuousness of consumption and abundance". In QTC it leads to the ever-increasing world of objects, as will be shown in the following chapter.

> "[I]n Baudrillard's view, it is the code, or the system of differences, that causes us to be similar to, as well as different from, one another."

This is the poststructuralist simultaneity of social distance and proximity. In QTC, it is operationalised by the psychological lens that, depending on the situation, either makes the incomparable (width) visible in *0/+consumption* and the comparable (length) invisible, or vice versa.

> "Baudrillard concludes that the sociological study of consumption (and everything else) must shift from the superficial level of conscious social dynamics to the unconscious social logic of signs and the code. In other words, the key to understanding lies at the level of deep structures."

In the sorting plant of culture, this logic of signs and the code is at work. In chapter 6, QTC will be augmented by the cultural dynamics that consumers themselves produce in the sorting plant at the level of deep material structures. And in chapter 7, the social impact that results from these material dynamics is addressed.

> "[B]ecause of their training, the upper classes are seen as having some degree of mastery over the code. It is the middle and lower classes who are the true consumers because they lack such mastery."

QTC abstracts from stratifying parameters and thus from the sociological category of class. But it distinguishes style leadership from style followers. Style leadership evinces a limited mastery of the code (see Table 11), which their followers are denied. In QTC, style leadership is the 'upper class' and its followers are the 'middle and lower class'.

> "In his view, 'anything can become a consumer object'. As a result, 'consumption is laying hold of the whole of life'."

Baudrillard's poststructuralism and QTC share an all-encompassing interpretation of consumption. All that produces differences is consuming, and consumption is all that has ever produced differences.

QTC is a poststructuralist theory. It abstracts from modernism's social structure of consumption and has its theoretical roots in semiotics. The objective function (13) captures this poststructuralism in a concise form. In QTC, as in poststructuralism, social volition takes place in the depths of culture. However, the formalisation of poststructuralism in the objective function (13) allows for a sharpness of analysis that is closed to the original.

Club Goods and Public Collective Goods Production

The private provision of public goods is a well-covered topic in economics. The orthodox concern is the conditions under which public goods can be provided efficiently, not only by the state but also by the private sector. This question, however, only makes sense if the good in question can be provided both by the state and by private entities. In the orthodoxy, this is assured by the premise that the production technology used to manufacture the good (e.g. public security) is the same whether it is utilised by the state or by private entities. This assumption simplifies the question of the efficiency of (alternative) private provision of public goods into a question of financing: under what conditions do private entities provide sufficient funding for the production of efficient quantities of public goods?

In this respect, too, QTC differs from the orthodoxy. Yet there is common ground in the private production of public goods. In QTC it is the common styles as club goods and the style system as the public good that are produced by private entities; in the orthodoxy it is, for example, public security. However, by assumption, the funding question does not arise in QTC – the world of objects is available for free. This shifts the issue of private versus public provision back to the production technology issue. Here it is evident that the orthodox theory of the private provision of public goods and QTC are dealing with disjunct topics. Not only would the assumption of identical production technologies for the state and the consumer be absurd. It is difficult to imagine how the state might be able to produce social distance and proximity for individuals. The consumptive production of social distance and proximity is the domain of the consumers themselves.

Restrictions for Style Followers

Which restrictions are consumers subject to? In the orthodoxy it is the budget restriction dictated by income and the goods price vector: don't spend more than you have. The budget can be divided into alternative consumption bundles, defined as quantity vectors of goods. Little Max can afford to buy so and so many Pepsi and pizzas with his pocket money. In the consumerism modelled by the orthodoxy, money is the limiting factor.

In QTC, the financial budget is irrelevant. The world offers its objects free of charge. By the definition of *0/+consumption*, of each element, x_j, from the world of objects, X, either one unit (or more) or no unit is consumed. The *0/+consumer decision* sets the individual style, s_i – that subset from the world of objects that the individual shows. The individual style either shows the quality x_j, or not. Let r be the number of style followers in the style system. The only restriction for style follower i, or more precisely, its stylistic composition restriction is:

$$s_i \subseteq X, \qquad i = 1, \dots, r \qquad (16)$$

All style followers are subject to the same restriction. Each individual style is a subset of the given world of objects, the finite set X. This is due to 'non-rivalry' in the consumption of qualities. If consumer i shows object x_j in their individual style, $x_j \in s_i$, then this object can also be shown in any other of the r individual styles. The composition restriction (16) can also be interpreted as an individual communication restriction in the style system. That is: everyone can say the same thing, $s_i = s_j, i, j = 1, \dots, r$, but do not have to; everyone can say all that can be said, $s_i = X, i = 1, \dots, r$, but no one has to. The only restriction is the availability of objects, the finite set of what can be nonverbally used to communicate.

The composition restriction (16) is the essence of the egalitarian postmodern antithesis to capitalist consumerism: everyone is an equal forger of their own happiness/utility! The sociologist Gerhard Schulze pinpoints this egalitarian property of (16) with his diagnosis of the postmodern losers in terms of happiness/utility: "In the members of the former lower classes one could see the exploited, the deceived, the powerless, people who had to be helped to realise their rights. The new distinction sees subjects where previously there was talk of objects, it sees actors instead of victims. It irreverently denies respect to all those who waste their day with nonsense and eat till they are fat and sick."[23] Condescension in postmodernism is thus directed at those who could make something good out of their lives, like everyone else, but fail to do so. Compared to the budget restrictions of orthodox consumerism, composition restriction (16) shifts the self-responsibility of the individual into the foreground. Where endowment differences no longer play a major role, meritorious concerns, such as those of a caring sociology, lose their legitimacy.

Restriction (16) not only represents the egalitarian side of postmodernism. In conjunction with the objective function (13), it directs the individual's decision-making interests away from accumulation towards lifestyle. Happiness/utility no longer depend on what one has, but on what one does.

Restrictions for Style Leadership

Table 8 from chapter 4 shows the increased agency of style leaders compared to their followers. But where are their restrictions? One of them is the counterpart to composition restriction (16). Let s_j be the individual style of style leader j, and let X' be the finite set of objects that can be loaded into it. X' contains not only that part of the world of objects usable by style followers, but also the subset of all stylistically usable objects that the style leader can invent. The style leader's counterpart to the stylistic design restriction of the style follower is:

$$s_j \subseteq X' \supset X \qquad (17)$$

The world of objects that the style leader can use is larger than that of its following. It can utilise qualities – the proverbial object that no one expected – that followers are not yet able to communicate with. Here, however, a temporal structure not shown in Table 8 must be taken into account. Restriction (17) applies in the short term, while in the long term, style followers are able to learn from their style leaders. Successful style leadership can be defined as accomplished learning of style followers, i.e. for successful style leadership the following applies in the long term:

23 Schulze 2005, p. XXI (my translation).

$$\lim_{t \to \infty} X = X' \qquad (18)$$

The set of objects that can be utilised by style followers in the long term converges towards the usable set of objects of their style leaders.

(17) is not the only restriction for the successful style leader. Style leaders must also observe restrictions on the part of their potential followers: not everything that style leaders are able to produce, are followers able or willing to reproduce. The exogenous culture for style followers, □, the set of instructions for the sorting plant of culture, however, is only to a certain extent 'crystallised history' for style leaders. Let □′ be the subset of culture that even style leaders cannot manipulate. Let □′ ⊂ □, that is, culture harbours taboos, conventions and norms for the creation of order in the world of objects, which the successful style leader cannot ignore. For that part of culture that can be manipulated by the style leadership, □″, □″ = □ \ □′. Table 11 summarises the restrictions for the style leadership, described in Table 8, and gives examples.

Table 11: Agency and individual restrictions for the representative style leader.

Options and Restrictions to Successful Style Leadership			
Agency		*Restrictions*	
Option for action	*Example*	*Type of restriction*	*Example*
Manipulation of the feature space $\underline{m}_j$(□″)	Transformation of objects into a different object category (e.g. positioning of insects as food)	Culture as crystallised history □′ even for style leaders	Tabu as avoidance commandment (e.g. food tabu) or tabu as cognition interdiction (e.g. Dumpsterdiving)
Manipulation of the sympathy vector $\underline{v}$(□″,$\underline{m}_j$)	Weighting of stylistic oppositions (see Chapter 2)		Tradition/habit/ideology (e.g. traditional higher weighting of museum art over popular art)
Choice of type of make (above-average vs. extreme type)	Performance cult (e.g. Beau Brummel)		Conventions, e.g. in the segregation of private from non-private life
Determination of the threshold value, d_K, for clustering	Separation (e.g. of rock 'n' roll from rhythm 'n' blues)		Tradition/habit/ideology, e.g. the traditional distinction between black and white music
Expansion of the world of objects, X, as inventor	DIY (e.g. base-jumping)	$s_j \subseteq X' \supset X$	Avoidance commandments, e.g. of danger, habit
Reactivation of pre-existing objects for a style	Bricolage (e.g. the jute sack in hipster style)		Ideology, e.g. avoiding what is old
0/+consumption			

□′ is the non-manipulable subset of culture, □, remaining even for style leaders, and □″ the manipulable part. The non-manipulable part of culture resists its manipulation by being taboo, mass habit, beloved tradition, defended ideology or stubborn (social) norm.

Culture as Dynamic Institution

The options for action and their restrictions shown in Table 11, turn $\square$, the set of instructions for the sorting plant of culture, into a dynamic economic institution. It contains taboos, habits, traditions, conventions and norms. With it, the unordered set of objects, X, is converted through consumptive production into the ordered set $(X, \square)$. It is exogenous to most people in society, the style followers – they can only use it as it is. For a few, the style leaders, part $\square''$ of these instructions is a variable. Through exemplary presentation, through wordless communication through their own *0/+consumption*, style leaders can give style followers new instructions for the sorting plant of culture.

Style followers ensure institutional constancy, style leaders effect institutional change. Style followers maintain taboos, cultivate habits, respect traditions, adhere to conventions, indulge in ideologies and heed norms. Style leaders breach taboos and break from habits, they are disrespectful of traditions and ideologies and do not adhere to conventions, nor follow norms. With their agency, style leaders influence style followers by changing what they adhere to in the sorting plant of culture. This is how they change the order $(X, \square)$ in part $(X, \square'')$: taboos drop or are replaced by others, habits change, traditions are superseded, conventions are replaced by others and norms are adapted.

It is too simple to assume that the non-manipulable part of culture would remain unchanged over time, $\square'_t = \square'_{t+1}$. Then there would be an immutable institutional core of culture that would survive for all time. This institutional core exists in the form of a few commandments and interdictions such as the taboo of incest or prohibition of killing. However, it is so small that it can be neglected here. Instead I assume:

$$\lim_{t \to \infty} \square'_t = \varnothing \qquad (19)$$

In the long run, the subset of instructions for culture's sorting plant, which cannot be manipulated by the style leadership, is the empty set.

Lingua franca as Restriction

Culture changes in the social realm. You can distinguish two types of social interaction. First, the interaction between style leaders – in the correspondence between Goethe and Schiller, in the liaison between Marianne von Werefkin and Alexei Jawlensky, or in the polemics of the architectural reformer Adolf Loos against the *Wiener Werkstätte* around Josef Hoffmann. Secondly, the interaction between style leaders and followers. A conceivable specification of the second type of interaction, to start from, is: followers only follow the style leadership of their own common style, i.e. style leaders have no influence on style followers in other elective affinities; and there is only one style leader in each elective affinity.

This specification has two consequences. First, the culture of society would eventually crumble into n subcultures, one for each elective affinity, because the sole style leader of an elective affinity is its cultural monopolist. Each elective affinity, i, will develop its own culture, $\square_i = \square_i''$, combined with their elective affinity-specific order of the world of objects, $(X, \square_i)$. It will no longer have anything in common with the order given to the world of objects in other elective affinities. The world of objects will lose its capacity for communication across social groups, it will lose its capacity as a *lingua franca*, understood and 'spoken' by everyone. Sectarianism, but also the mantra of parallel societies in urban centres could thereby be embedded in QTC.

The second consequence of this specification of leader-follower interaction, is that you implicitly assume a total loss of cultural and also social dynamics, above the level of the elective affinity. Because the emergence of new elective affinities, and with it the further differentiation of postmodern society, cannot be imagined when abstracting from the existence of (anonymous) individuals, who experimentally move out of existing elective affinities, but recruit their new followers from that reservoir. The capability of the style system as a whole to undergo change presupposes the existence of style leaders, whose manipulative agency transcends the boundaries of elective affinities. This in turn necessitates the ability to communicate on both sides.

But then you have an interaction between style leaders that culminates in their collective agency. It is the collective agency of style leadership which develops a social and cultural impact. The social impact is the allocation of followers between elective affinities, and the cultural impact is the transformation of the non-verbal *lingua franca* while maintaining its society-wide unity. It is only by this collective agency of style leadership that social distance and proximity can be produced by consumption.

This is the analytical pathway I will be following. Postmodernism thereby is understood as a society capable of permanent differentiation, in which the ability of non-verbal communication among all its members is preserved by the collective agency of style leadership.

The Cultural Trade-off

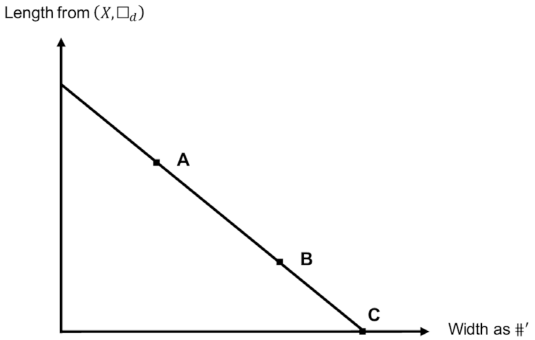
Collective agency of style leadership negotiates instructions, $\square$, for the sorting plant of culture, which are uniform for all elective affinities. Hence not only the punk himself, but also the banker assigns him to punk. A trivial social trade-off and a non-trivial cultural one result from this. In the social sphere, an individual cannot be a member of all elective affinities at the same time. In the simplest case, each individual belongs to only one elective affinity. If you allow for situation-specific elective affinities, each individual is allocated an individual alter ego portfolio, whose elements are activated by the perspect manager according to specific situations. So, the punk is a punk in the evenings and a blue collar worker during the day. In this social triage, the trade-off is by definition trivial, just as in the orthodoxy the trade-off imposed by the budget constraint is a trivial one. But in QTC the social trade-off is one of affiliation – belonging to an elective affinity excludes some others: a banker can perhaps pass for a gentleman, but hardly for a punk, and a punk can pass for a worker, but hardly for a banker. These social trade-offs are collectively negotiated.

In the sphere of culture, however, a non-trivial trade-off is effective. It is inherent in the distinction made in chapter 3, between dissimilarity as comparability and dissimilarity as incomparability. There, social proximity/individuality within the elective affinity was operationalised by (DIS_c, DIV_c) and social distance between affinities by (DIS_{ic}, DIV_{ic}). Both operationalisations are included in the objective function (13). Social volition of the individual, in terms of its objective function (13) and its properties (14), aims to achieve more of both: more dissimilarity/diversity as (or based on) comparability/incomparability. The collective cultural prowess of style leaders is subject to a non-trivial trade-off between these subgoals.

This is because social proximity results from (vertical) lengths of objects shown in a common style (Figure 6). Social distance, in contrast, results from the (horizontal) width of the common styles, defined by their antichains (Figure 8). Social distance and proximity are thus in an orthogonal relationship, as width (horizontal) and length (vertical). The cultural trade-off is this: for a given unordered set of objects, X, if its subset $(X, \square_d)$, ordered by a dominance order, $\square_d$, is enlarged, then the cardinality of all n antichains in the style system, $\#'$, $\#' \equiv \#(\sqsubset\sqsupset_1 \cup \ldots \cup \sqsubset\sqsupset_m)$, declines. Figure 9 shows this dependence.

The cultural trade-off can be exemplified in Figure 8. For example, if a new sorting instruction, $\square''$, requires that one of the singletons becomes an object in one of the existing dominance orders, then the subset $(X, \square_d)$ is enlarged by one and $\#'$ decreases by one. The order of the world of objects that shows itself in length grows richer and the order that shows itself in width gets sparser. This new sorting instruction increases the capacity of the world of objects for moderating social proximity, and its capacity for moderating social distance decreases. Hence, for a given set of objects, the potential for moderating social distance is minimal if all objects were arranged in a single chain. It is maximal if all objects were singletons; the potential of the world of objects for moderating social proximity then is nil.[24*]

Figure 9: The cultural trade-off.



The more objects from the finite set, X, that are dominated, the larger the length of the dominance order, $(X, \square_d)$, and the smaller the largest cardinality, #', of all antichains in the style system. At point B of the trade-off line, more width and less dominance order-induced length is possible than at point A and vice versa.

Cultural (In)efficiency

The dominance order and the order of a set of singletons are polar special cases. The first orders a set as a chain, |, the other as an antichain, ⊏⊐. In a chain, one object dominates another object in each element of the feature vector, $\underline{m}_j = (m_1, \dots, m_M)$, or vice versa. Both objects therefore contribute exclusively to length. Two singletons, in contrast, are incomparable in the feature vector. An equivalent formulation is that in each feature, m_i, of the feature vector a singleton dominates the other singleton and at the same time is dominated by it. A rank

24* For a general characterisation of the trade-off between length and width see Basili and Vannucci 2013.

distance between these non-identical objects cannot be established and therefore both contribute exclusively to width. A third formulation is that a singleton does not possess feature values but is a feature itself.

In the general case, however, one object dominates another object in one feature, m_i, and it is dominated by the other object in another feature, m_j. Both then relate to each other as two objects in a phylogram. They contribute to both length and width. Of course, such a partial order of objects has special properties for the achievement of objective (13). It moderates social distance *and* proximity. But a phylogram is a special case in itself. It is a tree, $\pitchfork$, free of dominated elements, i.e. free of chains. Let this special case be symbolised by $\pitchfork'$. The general case, $\pitchfork$, is a tree which also contains chains, $|$, (Figure 7).

From this I now derive the idea of *cultural (in)efficiency*. From an economic perspective, culture produces the output of a segmented order from a given input of non-ordered objects. This output has properties that have already been defined as length and width. Length and width moderate social distance and proximity/individuality. These are the determinants of objective function (13). From an economic perspective, the issue now is whether there exist *order types* that are more efficient in moderating social distance and proximity than other types. Four such order types have to be compared: the chain, $|$, the antichain of singletons, $\sqsubset\sqsupset$, the tree containing dominated objects, $\pitchfork$, and the phylogram, $\pitchfork'$.

Cultural inefficiency of one order type compared to another exists when, for a given non-ordered set of objects, a second order type is better able to moderate distance (proximity), without moderating social proximity (distance) to a lesser extent than the first order type. According to this definition, order type B is culturally more efficient than order type A (that is, A is inefficient), if – for a given set of objects – A does not moderate greater width than B and B moderates greater length than A.

Let $A \prec B$ imply that order type B is culturally more efficient than type A. Let X be a non-ordered set of h objects. Let $(X, \pitchfork')$ be a phylogram containing all elements of X. Let $(X, \pitchfork)$ be a tree, containing all elements of X, which contains at least one chain. Let $(X, \sqsubset\sqsupset)$ be the set X, ordered as singletons only, and let $(X, |)$ be a chain containing all elements of X. The length of $(X, \sqsubset\sqsupset)$ is zero and its width, $\#\sqsubset\sqsupset$, is h. The width, $\#\pitchfork'$, of each phylogram, containing all elements of X, is $\#\pitchfork' = \#\sqsubset\sqsupset = h$. This property of each non-ordered set, X, is seen for example in Figure 6: There $X = (A, B, C, D, E)$ and $h = 5$; and irrespective of whether (A, B, C, D, E) is ordered as an antichain of singletons or as a phylogram, width is $h = 5$. However, the length of $(X, \pitchfork')$ is positive and hence greater than the length of $(X, \sqsubset\sqsupset)$. Order type $(X, \pitchfork')$ is able to moderate the same social distance than order type $(X, \sqsubset\sqsupset)$, but greater social proximity/individuality than

$(X, \sqsubset\sqsupset)$. Hence, for any non-ordered set X, order type $(X, \pitchfork')$ is culturally more efficient than order type $(X, \sqsubset\sqsupset)$. That is, $(X, \pitchfork') \succ (X, \sqsubset\sqsupset)$.

Now, turn to the (in)efficiency of the chain in comparison to the phylogram. According to (13), the chain positively affects goal achievement only by diversity DIV_c^c. If we find a phylogram with DIV_c^c at least as great as that of any chain, given X, then there exists an order of type $(X, \pitchfork')$, which is more efficient than all chains, because it is also able to moderate greater social distance than chains.

Phylograms derived from rank distances have this potential. This can be shown in an example with two objects. This is the minimal number of objects, h, on which the order types $(X, \pitchfork')$ and $(X, |)$ can be applied. The existence of a chain also presupposes at least the existence of a single feature in the feature vector $\underline{m}_j = (m_1, \dots, m_M)$, that is, $M \geq 1$. For $h = 2$ and $M = 1$ the rank distance of the chain is $d_{ij}^r = 1$ (see footnote 4*, chapter 4). In contrast, the existence of a phylogram requires at least two features in the feature vector, that is, $M \geq 2$. Because with only one feature, only the order types $(X, \sqsubset\sqsupset)$ and/or $(X, |)$ are applicable on X, that is, with only one feature any two objects are either positioned one above the other in a dominance order, $\square_d$, or as singletons side-by-side in an antichain, $\sqsubset\sqsupset$. For $h = M = 2$, $d_{ij}^r = 2$, regardless of whether X is ordered as a chain or phylogram (see footnote 4*, chapter 4). The width of the chain is $\#\sqsubset\sqsupset = 1$, from the one dominant object. Every chain with $h = 2$ and $M = 1$, and hence $d_{ij}^r = 1$ can be transformed, however, into a phylogram with $d_{ij}^r = 2$, by a simple cultural manipulation: replace the feature vector $\underline{m}_j = (m_1)$ with the vector $\underline{m}_j = (m_1, m_2)$, with the properties that in feature m_2, that object dominates the other object, which is dominated by that object in feature m_1. By this cultural manipulation, a set of two objects ordered as a chain with $d_{ij}^r = 1$ and $\#\sqsubset\sqsupset = 1$ is sorted into a phylogram with $d_{ij}^r = 2$ and $\#\sqsubset\sqsupset = 2$. This phylogram is more efficient than the chain from which it was derived by enlarging the feature space.

This cultural manipulation can be generally applied to any (finite) number of objects greater than one in the non-ordered set, X, as well as any (finite) number of features in the feature vector. The length, DIV_c, of any chain, built from a finite number of objects, h, and a finite number of features, M, is finite, and its width remains $\#\sqsubset\sqsupset = 1$. Every enlargement of the feature vector by one more feature, which causes a reversal of dominance in this feature of at least two objects compared to the chain, does not decrease DIV_c of the phylogram compared to the chain, and the width is at least two.

Let C be the set of chains that can be built from the non-ordered set X by order type $(X, |)$, and let P be the set of phylograms that can be built from that same set by order type $(X, \pitchfork')$. From the preceding considerations, for each chain, built with a finite number of features from a non-ordered finite set of objects, there exists at least one phylogram that is more efficient than the chain, that is, $\forall \mid \in C \ \exists \pitchfork' \in P$, such that $\pitchfork' \succ \mid$.

There remains the case of the (in)efficiency of trees containing chains, $\pitchfork$. On chains in trees the same cultural manipulation of feature vector expansion can be applied, as has already been used for showing the inefficiency of the chain compared to the phylogram. For as long as at least one object exists in a tree that is dominated by another object, and culture activates an additional feature so that the object is no longer dominated, length will not decrease and width of the tree will increase. This potential is only exhausted when the tree has become a phylogram. Let T be the set of all trees of order type $(X, \pitchfork)$ that can be built from X. Then for each tree, $\pitchfork$, there exists a phylogram from this non-ordered set, which is more efficient than this tree, that is, $\forall \pitchfork \in T \ \exists \pitchfork' \in P$, such that $\pitchfork' \succ \pitchfork$.

It is now possible to make a general statement on the cultural (in)efficiency of the four order types $(X, \pitchfork')$, $(X, \pitchfork)$, $(X, \sqsubset\sqsupset)$ und $(X, \mid)$. Let $\underline{m}_j^*$ be a feature vector with a greater number of features than $\underline{m}_j$, such that the number of dominated objects is smaller when $\underline{m}_j^*$ is applied than when $\underline{m}_j$ is applied. Then the efficiency properties of the order types of culture are:

$$(X, \pitchfork') \succ \left\{ \begin{array}{c} (X, \sqsubset\sqsupset) \\ (X, \mid) \text{ if } \exists \ \underline{m}_j^* \\ (X, \pitchfork) \text{ if } \exists \ \underline{m}_j^* \end{array} \right\} \qquad (20)$$

The efficiency of culture in the consumptive production of social distance and proximity is greater when it orders a non-ordered set, X, as a phylogram, compared to when it orders it as an antichain of singletons, or as a chain (i.e. with a single undominated object), or as a tree with chains. The first efficiency statement (on the antichain) is without reservation. The other two efficiency statements (on the chain and on the tree in general) are subject to potentiality. They are valid under the condition of a sufficient capability of culture, to reduce the number of dominated objects to zero by activating additional features of objects. In the following chapter I will argue that this capability is almost unlimited.

From objective function (13) and the cultural restrictions and trade-offs discussed in this chapter, we are now able to derive predictions for individual and collective behaviour.