Structural-Morphism System Property: *atis*Commensalmorphismness

(*Structural-morphism system properties* are those properties that are part of the theory and define the mapping-relatedness of object-set components.)

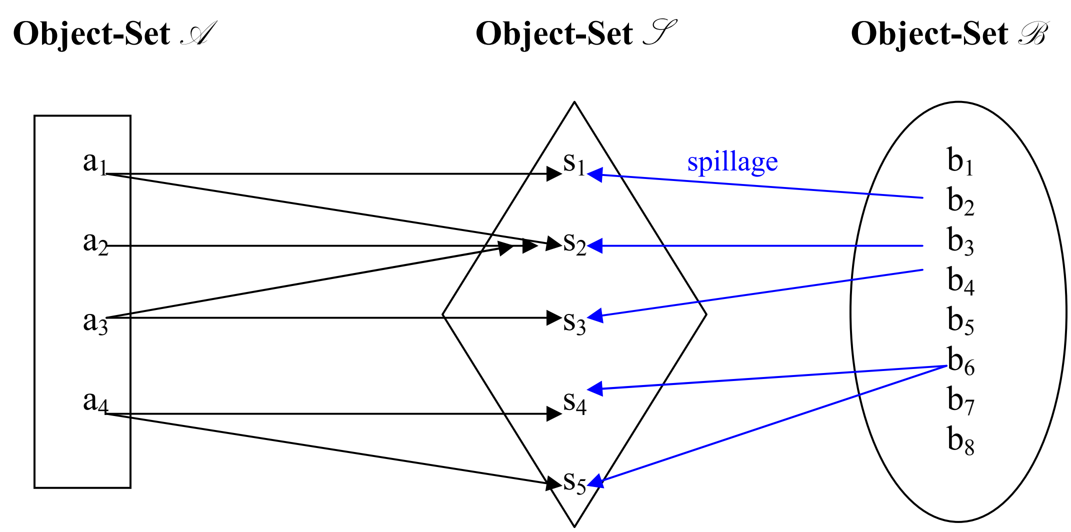
Commensalmorphismness, $\mathfrak{C}(\mathbb{S}_1,\mathbb{S}_2)$**,** $=_{df}$ a relation between coterminous systems by which one increases complexity while the other maintains steadiness.

$$\mathfrak{C}(\mathbb{S}_1,\mathbb{S}_2) =_{df} \mathcal{M}(\mathbb{S}_1,\mathbb{S}_2) \mid {}_{CT}(\mathbb{S}_1,\mathbb{S}_2) \wedge \mathbb{S}_1(\mathcal{G}(\mathcal{X})) \wedge \mathbb{S}_2({}_{S}\mathbb{S})$$

Commensalmorphismness of systems $\mathbb{S}_1$ and $\mathbb{S}_2$ is defined as morphism between the two systems such that the systems are coterminous systems, and the first system is increasing in complexity, and the second system maintains steadiness.

Commensalmorphism, $=_{df}$ a homomorphism that is an epimorphism between the object-set of one system and the negasystem spillage of a coterminous system.

The following homomorphism, $f_{comm}: \mathcal{A} \to (\xi(\mathcal{B}))$, defines a *commensalmorphism*; where $\xi(\mathcal{B}) = \mathcal{S}$; that is, $\xi_{spillage}: \mathcal{B} \to \mathcal{S}$.



This definition can also be stated more explicitly as follows:

$$_{\mathrm{CT}}(\mathbb{S}_1,\mathbb{S}_2)_{t(1)\text{-}t(2)} \supset \mathcal{X}(\mathbb{S}_{1\phi:\,t2}) > \mathcal{X}(\mathbb{S}_{1\phi:\,t1}) \wedge \Delta\mathcal{S}'[\mathcal{A}(\mathbb{S}_2)]_{t(1)\text{-}t(2)} \Vdash \Delta\mathcal{S}_{t(1)\text{-}t(2)}(\mathbb{S}_2) < \alpha$$

If $\mathbb{S}_1$ and $\mathbb{S}_2$ are coterminous systems from time t_1 to t_2, then the complexity of the $\mathbb{S}_1$ relation-set at t_2 is greater than the complexity of the $\mathbb{S}_1$ relation-set at t_1; and the change in the negasystem spillage from t_1 to t_2 yields a change in the $\mathbb{S}_2$ state that is less than α.

Under these conditions, a homomorphism is defined from the $\mathbb{S}_1$ object-set to the $\mathbb{S}_2$ spillage that is defined as a *commensalmorphism*:

$$f{:}\mathbb{S}_{O1} \rightarrow \mathcal{A}(\mathbb{S}_2)$$

The last assertion of the above definition, $\Delta\mathcal{S}_{t(1)\text{-}t(2)}(\mathbb{S}_2) < \alpha$, is critical for this definition. By this definition, it allows for the *commensal bacteria* to interact with the immune system without changing the state of the system, something that happens frequently with commensal bacteria. This is also critical for other systems where there may be some minimal interaction between the two systems that do not essentially affect the state of the second system.

This definition of *commensalmorphism* has been defined due to the lack of any apparent appropriate function that defines this mapping. This homomorphism is essential to a clear understanding of the affect relations that may exist in various social systems. This mapping, while identifying only two sets, actually defines a relation between three—the initial system, the second system, and the environment of the second system that is derived from the second system.

Initially, we will consider '*commensal'* as defining a relation between two systems in which the first system derives benefit from the second system while leaving the second system unchanged. The clown fish living in the tentacles of an anemone is a commensal fish. However, we need to look at this relation more carefully.

'Commensal' generally refers to the society of microflora within human intestine that absorb nutrients from digested food called commensal bacteria or commensal microflora. This indigenous bacteria co-exist with the human surviving while not (normally) causing any benefit or harm to the human. They survive by not invading the body past the intestinal mucosa that would initiate an immune system response, killing the bacteria.

'Commensal' refers to the bacteria in their capacity as existing without causing any positive or negative interaction with the "host." If such interaction becomes detrimental to or of a benefit to the host, then such bacteria would cease to be commensal. This distinction must be made since there is a question concerning the possibility that this commensal bacteria may, when developing its own protections against other invasive pathogens may develop immunities that are passed onto pathogens that give them the ability to invade the body by overriding the immune system. If such occurs, then the commensal bacteria are no longer "commensal."

As a result, we will define 'commensal' as follows:

Commensal $=_{df}$ a relation between two systems in which the first system derives input from the second system's spillage-environment, while leaving the second system unchanged.

It is clear that the benefit received by the first system cannot be derived directly from the second system, since such would in fact result in a change of the second system, thus nullifying the "commensal" nature of the first system. Therefore, the benefit derived by the first system cannot come directly from the second system. This benefit, while being derived from the second system, is obtained from its environment as spillage. For example, the nutrients derived from commensal bacteria in the intestine are nutrients not used nor fought over by either system. The nutrients have "left" the second system and are available to the first. Such a condition is characterized by spillage from the second system.

For example, *commensal shop owners* thrive in a university community. They do not impact the university, and have no specific relation with the university, yet they obtain input from the faculty and students who live in the environment of the university. When the faculty and students are functioning as faculty and students within the university system, they are not available to the shop owners. However, when they exit that system on a daily basis and provide resources for shop owners, such is inconsequential spillage from the university system. That is, the shop owners feed off the university without affecting, positively or negatively, the activity of the university. Yet, the shop owners thrive specifically from components of the university that provide spillage into the community capitalized on by shop owners in the community.

As a result of the preceding, commensalmorphism is defined as follows:

$f_{\text{comm}}: \mathscr{A} \to (\xi(\mathscr{B}))$, defines a *commensalmorphism*; where $\xi(\mathscr{B}) = \mathscr{S}$; that is, $\xi_{\text{spillage}}: \mathscr{B} \to \mathscr{S}$.