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Fifty Shades of Social Cognition. How to Capture the Varieties of Socio-cognitive Abilities?

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Abstract

Numerous disciplines study the nature of social cognition. Also, in philosophy of mind, there are discourses about socio-cognitive abilities, such as joint action, mindreading, and commitment. However, the so-called standard notions require demanding conditions, which leads to the fact that, for example, abilities of young children and non-human animals cannot be captured by this terminology. By introducing minimal notions, a step has been taken to capture a greater variety of phenomena in the field of social cognition. In this way, current empirical findings can be connected to the theoretical work in philosophy. However, when one characterizes minimal and standard notions by a dichotomous interpretation of a two-system approach, quite a few instances are still falling through the conceptual net. This paper will demonstrate how many instances remain neglected and explore the challenges to develop a disjunctive conceptual schema that can capture the varieties of socio-cognitive abilities.

Keywords: social cognition; minimal approaches; conceptual framework; disjunctive conceptual schemata

Introduction

Numerous disciplines study the nature of social interactions and social cognition. This is an exciting interdisciplinary field of research combining developmental psychology, neuroscience, cognitive science, linguistic, and philosophy to study the mind of social agents. It aims at illuminating our understanding of cognitive processes that enable social interactions.

However, standard notions of socio-cognitive abilities in philosophy of mind, such as joint action, mindreading, or commitment, tend to be rather restrictive. For example, notions identifying certain social interactions as joint actions characterize them as if they were unique to sophisticated adult human beings (Bratman, 2014). Evaluating the demanding criteria of the standard terminology of philosophy, it is not surprising that it reaches its limits when it comes to socio-cognitive abilities of other agents, such as children, non-human animals, and eventually artificial agents. From a philosophical perspective, aiming for sharp, clear-cut notions leads to restrictive notions. However, empirical findings in developmental psychology and animal cognition indicate that, for example, cooperative activities such as joint actions can also be found in children and non-human animals (Warneken et al., 2006). Since the standard terminology in philosophy cannot account for those phenomena, there is a pressing motivation to consider a broader conceptual framework that can overcome the restrictive nature of standard notions.

To connect empirical findings with the theoretical work in philosophy, I argue that there are reasons to overcome the restrictive nature of standard notions. In light of empirical findings, the question arises of how to justify a restrictive conceptual framework that captures only a subset of instances of a phenomenon. To argue for a conceptual framework that is descriptively more complete, one can point out that limiting application scenarios to fully developed (adult) humans can be interpreted as an expression of an anthropocentric view. After all, the exclusion of other possible agents presupposes a specialness of the human species, and perhaps humans are not that special after all. Considering the idea of multiple realization, one may encounter comparable abilities of other agent types. In addition, humans are not born with fully developed socio-cognitive abilities either; they go through developmental stages. Therefore, a conceptual framework that can capture multiple stages of this development would be desirable.

This challenge that standard notions tend to be too restrictive to capture a broader spectrum is not a completely new one but has become especially pressing in view of recent empirical research with infants, non-human animals, and artificial agents. Many of these findings are difficult or impossible to be explained with philosophical notions that are tied to highly demanding forms of social cognition. Earlier proposals responding to shortcomings of standard notions already suggested extending restrictive conceptual frameworks by introducing terms such as simple forms, proto-cases, or quasi-states. One example is the notion of simple thoughts to describe thinking-abilities of non-human animals (Perler & Wild, 2005).

Aiming to capture a broader diversity of socio-cognitive phenomena, recent so-called minimal approaches follow a comparable strategy. In order to account for young children as socially engaging agents while realizing that young children do not meet the demanding conditions required by the standard notion of joint action (Bratman, 2014), new minimal versions of the standard notions were developed. The general idea of such approaches is to question whether there is only one way to realize, for example, the ability to act jointly. Assuming multiple realizations, an alternative set of conditions can additionally capture instances of the ability in question. Thereby, minimal notions are challenging the exclusivity of demanding conditions of standard, philosophical conceptions. In this spirit, the notion of *minimal mindreading* demonstrates how it is possible in a limited but useful range of situations to track others'

perceptions and beliefs by less demanding conditions (Butterfill & Apperly, 2013). Other examples are notions such as *minimal joint actions*, *minimal sense of commitment*, or *shared intentions lite* (Vesper et al., 2010; Michael et al., 2016; Pacherie, 2013). In sum, minimal approaches contribute to the aim to cover a broader spectrum of socio-cognitive abilities.

However, establishing a conceptual framework that integrates minimal and standard notions leads to new difficult questions. Since minimal notions are not meant to replace standard notions, one has to examine how minimal and standard notions relate to each other. Another challenge concerns the limits of a phenomenon. If the new set of minimal conditions gets too minimal, it might be questionable whether this notion still captures an instance of the same phenomenon or rather describes another phenomenon. This becomes, for example relevant, if one wants to distinguish mindreading from behavior-reading. Consequently, integrating minimal notions into a broader framework accounting for multiple realizations of socio-cognitive abilities requires a clear-cut demarcation from other phenomena. Even though the question of how we can avoid that minimal notions get „too minimal“ is important, this paper will focus on the first question, namely of how minimal and standard notions relate to each other.

How Minimal and Standard Notions Relate to Each Other

Minimal notions aim to capture instances of a phenomenon that fall into the same category as the instances described by standard notions but happen not to meet the same conditions. Since the distinction between instances captured by minimal notions from instances captured by standard notions is motivated by the idea of multiple realization, referring to distinct kinds of underlying processes seems, at first glance, natural to characterize them. The underlying assumption is that the fulfillment of minimal necessary conditions as required by the minimal notions is realized by a different type of cognitive processes than the fulfillment of demanding conditions of the standard notions.

Indeed, it is a widespread strategy to refer to a two-systems approach or a dual-process approach (Kahneman, 2011; Evans & Stanovich, 2013) to distinguish the underlying processes characterized by minimal and standard notions, respectively. A two-system approach assumes that there are two styles of cognitive processes, one realized by system-one and the other by system-two. One type is described as automatic, unconscious, and uncontrolled, and the other as non-automatic, accessible to consciousness, and controlled. In a further step, it is then claimed that prototypical conditions of minimal notions are realized by system-one processes. In contrast, conditions of standard notions are satisfied by system-two processes. In short, automatic, unconscious, and uncontrolled system-one processes realize cognitively less demanding and less effortful processes, whereas system-two processes are characterized as cognitively demanding processes that require, for example,

mastery of language and meta-representations. That is, standard terms reflect properties of system-two processes and minimal terms reflect properties of typical system-one processes. Thereby, multiple realizations of one and the same socio-cognitive ability can be explained by reference to two distinct systems. However, following such a dichotomous interpretation results in critical shortcomings and neglects interesting in-between cases.

Shortcomings of a Dichotomous Interpretation

To connect empirical findings with the theoretical work in philosophy, introducing minimal notions is a step in the right direction to capture the diversity of phenomena in the field of social cognition. However, restricting the relation between minimal and standard notions through a dichotomous interpretation of a two-system approach leads to the fact that still several instances fall through the conceptual net.

In the following, I will show that a dichotomous interpretation neglects gradual appearances of properties and ignores interesting combinations of properties from both systems (for more details, see Strasser, 2020).

Gradual Appearances of Properties Separating properties along two systems goes along with an ascription of those properties in an either-or manner. Either a process is characterized as automatic, unconscious, and uncontrolled or a process is non-automatic, accessible to consciousness, and controlled.

According to a dichotomous interpretation of a two-system approach, processes realizing, for example, mindreading are either automatic or non-automatic. Cases in which more or less automaticity is present cannot be captured. The same applies to the property of being controllable and aspects of accessibility, summarized by the dichotomy of conscious and unconscious. However, empirical findings often speak for a continuum with respect to many properties characterizing socio-cognitive processes. From this, one can conclude that a dichotomous understanding of a two-system approach neglects in-between cases, as illustrated in table 1.

Table 1: gradual manifestations of properties.

	system-one	<i>neglected in-between</i>	system-two
automatic	automatic	<i>more-or-less automatic</i>	non-automatic
central accessibility	no central accessibility	<i>limited central accessibility</i>	central accessibility
access other information	informational encapsulated	<i>limited accessibility</i>	accessibility
controllable	no control	<i>partial control</i>	control

With respect to automaticity, there are empirical findings that show, for example, that automaticity can gradually improve with consistent practice (Shiffrin, 1988; Logan, 1985; MacLeod & Dunbar, 1988; Kahneman & Chajczyk, 1983).

Turning to accessibility, one can also argue for a continuum. One can locate informational encapsulation and lack of central accessibility (system-one) on one side of an assumed continuum. This describes processes that cannot access information stored elsewhere in the cognitive system and have the property that other processes cannot access information entailed in those processes. Such processes can neither be inhibited nor modulated. On the other side, there are processes that can access other information and whose information can be accessed by other processes (system-two). In-between, however, there are cases imaginable in which both properties, access to other information and the passing on of information, are pronounced in different degrees.

Likewise, controllability has multiple manifestations. For example, concerning tool-use, we distinguish several levels of how much control a user has over a tool. Not all tools are under our complete control; some even display grades of autonomy and are able to adapt and learn. This is reflected, for example, in the distinction between so-called in-the-loop systems, on-the-loop systems, and out-of-the-loop systems (cp. Loh, 2019). The former is subject to human control throughout, whereas out-of-the-loop systems describe machines in which humans even do not have an intervention option. In-between, there are on-the-loop systems, which have some autonomy, but the human still can intervene. Applying this to socio-cognitive processes, we can suspect that in addition to processes that are either under complete control or cannot be controlled, there are processes that can be partially controlled.

Although integrating minimal notions into a conceptual framework contributes to capturing a greater diversity of socio-cognitive phenomena, remaining with a dichotomous conceptualization is not sufficient. It is misleading to characterize the processes underlying socio-cognitive abilities in such an either-or manner when one aims to capture the full diversity. Therefore, when considering, for example, a continuum of automaticity, one should be able to conceptually grasp that processes can be more or less automatic. This means that one needs a framework capable of dealing with intermediate cases in which properties vary in degrees.

It is obvious that a dichotomous interpretation of a two-system approach cannot capture such in-between cases. Considering the varieties of socio-cognitive processes exhibiting properties that vary in degrees, one needs a framework that is able to handle continuously changing properties. Describing a continuum of instances, we need both a start-point and an end-point. To this end, the distinction between system-one and system-two may help mark extreme cases on each side of the continuum. The pressing question is to find a strategy of how to conceptualize

in-between cases. Linguistically you can, of course, make multiple subdivisions by specifying the more or less by phrases like „completely,“ „not fully,“ „quite,“ „under certain circumstances,“ „partly not,“ and „nearly not.“ Before returning to this problem, I describe another class of neglected instances.

Combination of Properties Besides the fact that properties can change gradually, there is another shortcoming, namely the fact that the combination of certain properties exhibits a greater diversity than a dichotomous interpretation of a two-system approach can capture. Aiming for a broader framework capturing the diversity of socio-cognitive abilities, one should be able to capture somehow surprising combinations of properties.

Taking automaticity as an example, traditional approaches assume that being automatic necessarily co-occurs with four other properties, which are typical system-one properties, namely being unconscious, unintentional, efficient, and uncontrollable (cp. *The four horsemen of automaticity*: Bargh, 1994). If the counterfactual criteria are met, namely being conscious, intentional, not so efficient, and controllable, then a process qualifies as non-automatic. However, empirical findings indicate that not all automatic processes are necessarily simultaneously unintentional, unconscious, efficient, and uncontrollable. Processes can be conscious but uncontrollable, unintentional but still controllable, or efficient and intentional (Gawronski & Bodenhausen, 2006). This poses a severe problem for a dichotomous interpretation along the two-system approach since this interpretation does not allow that a process exhibits properties from both systems at the same time. Consequently, certain combinations of properties that are indicated by empirical findings cannot be captured by a dichotomous separation of system-one and system-two processes.

Acknowledging that some processes are, at the same time, automatic in one sense and non-automatic in another sense, it seems feasible to argue for a disjunctive conceptualization of automaticity by which a process can be characterized as automatic if it meets, for example, at least one of the four criteria. Thus, one could capture multiple instances of a phenomenon that stand in a relation of family resemblance (Wittgenstein, 1953). Such a disjunctive classification schema would, of course, have to take into account whether in practice any of the required criteria might be interdependent.

In the case of automaticity, it is likely that empirical investigations will indicate that the appearance of some criteria is not independent from each other. This means the above suggested conceptual schema has to be adopted in order to make sure that certain cases are excluded.

The following considerations do not claim to propose a conceptual framework for a concrete socio-cognitive ability. Rather, the goal is to reflect on a theoretical level how many instances of a phenomenon can fall through a conceptual net if neither gradual manifestations of properties nor the diversity of combinations of properties are considered.

A Short Excursion into the Realm of Combinatoric

To get an idea of the number of neglected instances, I propose an excursion into the realm of combinatorics. The following considerations are detached from concrete conceptual schemata. For example, potential dependencies between variables representing required criteria are neglected. The goal is to estimate the number of neglected instances on a theoretical level and show how difficult it is to group the diverse number of neglected instances in a meaningful way.

Combination of Properties

Let's start with some considerations about a hypothetical conceptual schema that would capture a family resemblance of several instances of a phenomenon. Thereby, the necessity of co-occurring criteria is questioned, and all instances captured by a disjunctive conceptual schema will be investigated.

Imagine a hypothetical socio-cognitive ability that can be ascribed if at least one of four criteria (C1, C2, C3, C4) is fulfilled. Each instance of this ability can be represented by a tuple of four variables. To begin with, I will not consider gradual changing criteria. That means each variable representing one of the four criteria can either have the value 1 or 0. Consequently, the tuple (1,1,1,1) would represent the instance in which all criteria are fulfilled. Let P^{disjunct} be the set of all tuples captured by a conceptual schema „at least 1 of 4.“ The number of elements of this set results from the possible permutations of the conceivable tuples. It amounts to 15 instances since at least one of the variables forming a tuple must be greater than 0, which excludes the tuple (0,0,0,0) from the possible permutations ($4^2-1=15$).

Looking for a way to categorize those instances, it seems natural to group them along the number of criteria met (criteria strategy). This gives us four subsets. The subset P_{min} would include the four instances for which 1 of 4 criteria is met. P_{max} would be a one-element set with the tuple (1,1,1,1). The remaining ten instances can be assigned to $P_{\text{in-between } 3}$ or in $P_{\text{in-between } 2}$.

Reconsidering the dichotomous interpretation of a two-system approach, both standard and minimal notions rely on necessary co-occurring criteria. Consequently, each of them does only capture one element in P_{max} .

Whenever we have reasons to question the necessity of the co-occurrence regarding required criteria, we should opt for disjunctive conceptual schemata. In such cases, relying on a categorization into only two kinds of realization (realized either by system-one or system-two) is not sufficient to capture the diversity of socio-cognitive processes.

However, the following theoretical considerations will show that capturing all neglected instances in the theoretical space presents a real challenge. The more distinct instances are to be covered, the more urgent it is to find a strategy that can avoid getting lost in too many differentiations despite considering all possible instances. Already in the above-described case that requires at least one of four criteria as necessary, one has to handle 14 additional instances. Taking

into account that conceptual schemata easily can include more than four criteria, it becomes obvious that a general decision of how to categorize potential in-between cases in a reasonable way can become difficult if not impossible.

Gradual Appearances of Properties

Things get even messier if one also takes into account that criteria may vary in degrees. Then the number of distinct instances increases to an amount, which makes it hard to find reasonable ways to group them.

Now, I expand our hypothetical conceptual schema „at least 1 of 4“ so that it can capture varying degrees of the criteria. To this end, I limit the number of variations to three manifestations, namely weak, middle, and strong. Again, each instance is represented by a tuple of four variables, whereby now each variable representing a criterion can have the value of 1,2,3 or 0. Let $P^{\text{disjunct} + \text{vary}}$ be the set of all permuted tuples. Again, the tuple (0,0,0,0) must be excluded from the possible permutations because at least one variable of the variables forming a tuple must be greater than 0. The number of potential instances now amounts to 255 ($4^4-1=255$).

Alone the subset P_{max} considering instances in which all four criteria are met entails 81 instances. P_{min} entails 12 instances for which just one criterion is met. In-between, there are still 162 instances in which either two or three criteria are met in different degrees. The one instance captured by a standard notion is then contrasted with 255 instances captured by a disjunctive schema that allows for gradually varying criteria.

Aiming to take both shortcomings into account, one has to develop a strategy of how one can handle gradually changing criteria as well as the diversity of combination of criteria without getting lost in unclear, unsharp, endless definitions and find a reasonable method of how to structure the neglected in-between instances into categories.

How to Handle Neglected In-between Cases?

Integrating minimal notions in a conceptual framework is a step in the right direction to capture the diversity of socio-cognitive phenomena. However, the above considerations show that one must still be careful not to leave a large number of instances undetected. Since there are socio-cognitive phenomena that neither qualify as mere system-one processes nor as pure system-two processes, it is not an option to characterize the relation between minimal and standard notions along a dichotomous interpretation of a two-system approach. Both the restriction to an either-or assignment of criteria and the rigidly fixed co-occurrence of certain criteria prevents us from capturing the full diversity of socio-cognitive phenomena.

Given that criteria can vary in degrees, the first challenge is to develop a conceptual framework that can deal in a satisfactory way with continua. From a philosophical perspective, however, there are at least two features concerning continua that pose a major challenge to the ambition of clearly delineated conceptualizations. First, to

speak of a continuum is to assume that there are gradual transitions from one instance to another without abrupt changes. In contrast, philosophical terms strive for clear demarcations. This means that a philosophical conceptual framework designed to capture a continuum must still define sharp boundaries, at least for the start-points and end-points of particular domains. Second, one can always zoom into a continuum and find an infinite number of instances since a third instance can always lie between any two instances. Philosophical conceptual frameworks, however, usually aim to spell out a finite number of paradigmatic instances. To reconcile the requirements of a well-defined philosophical conceptual framework and the diversity of socio-cognitive phenomena, one can neither follow a dichotomous nor a fully continuous strategy.

To avoid an infinite number of instances, I propose to limit the number of different manifestations in which the criteria can occur. For example, to limit the number of instances captured, it seems reasonable to assume that each criterion can have only three different values (weak, medium, and strong). This is comparable to the strategy of how psychology is dealing with continua. To this end, it is, for example, assumed that there are three instances in-between disagreement and agreement. Consequently, measuring agreement, a five-level Likert scale is used to distinguish between different manifestations.

The next step is to divide the whole spectrum of instances into several areas. With respect to the different manifestations of criteria, one can thus leave the dichotomous realm of "yes or no" and move to a conceptual schema that distinguishes between three ways in which criteria can be realized. I will label this as the degree strategy.

Now, in order to capture neglected instances in terms of the possible combinations of properties, one can adopt an analogous strategy by using the number of fulfilled criteria as a distinguishing feature between several domains arising from a disjunctive conceptual schema. I will label this as the criteria strategy. Both strategies suggest a way to group neglected instances; the first concerns gradual appearances and the second the variety of combinations of criteria. However, it will be demonstrated that it is a hard challenge to determine how to combine these two strategies.

To spell out the degree strategy, I consider the set of 81 instances in which all four criteria are satisfied and variations in degree are allowed (P_{max}). As illustrated in table 2, we can distinguish here between 15 principally distinct realizations. It is uncontroversial that the tuple (3,3,3,3) and the tuple (1,1,1,1) mark the start-points and end-points, respectively.

Table 2: 15 realizations of instances of P_{max} .

4 strong	3 strong, 1 middle	3 strong, 1 weak	2 strong, 2 middle
2 strong, 1 middle, 1 weak	3 middle, 1 strong	2 middle, 1 strong, 1 weak	4 middle
2 strong,	2 weak,	3 middle,	2 middle,

2 weak	1 strong, 1 middle	1 weak	2 weak
3 weak, 1 strong	3 weak, 1 middle	4 weak	

In order to group the other 13 realizations, one can summarize them according to the cross sum of their variables. For example, the cross sum of a tuple representing an instance of (3 strong \wedge 1 weak) is equal to the cross sum of a tuple representing an instance of (2 strong \wedge 2 middle) ($3+3+3+1=3+3+2+2$). Thereby, one can establish nine groups capturing the 15 realizations. Assuming that such a fine-grained distinction of nine categories cannot be meaningfully mapped into a conceptual framework, one could further reduce the number of categories by grouping them into triples, namely one belonging to the start-point domain, one characterizing in-betweens, and one belonging to the end-point domain. The assignment of the 15 realization options is shown in table 3.

Table 3: potential order of 81 instances.

15 distinct realizations		example	cross sum
MAX	4 strong	3,3,3,3	12
	3 strong / 1 middle	3,3,3,2	11
	3 strong / 1 weak	3,3,3,1	10
	2 strong / 2 middle	3,3,2,2	10
IN-BETWEEN	2 strong / 1 middle / 1 weak	3,3,2,1	9
	3 middle / 1 strong	2,2,2,3	9
	2 middle / 1 strong / 1 weak	2,2,3,1	8
	4 middle	2,2,2,2	8
	2 strong / 2 weak	3,3,1,1	8
	2 weak / 1 strong / 1 middle	1,1,3,2	7
	3 middle / 1 weak	2,2,2,1	7
MIN	2 middle / 2 weak	2,2,1,1	6
	3 weak / 1 strong	1,1,1,3	6
	3 weak / 1 middle	1,1,1,2	5
	4 weak	1,1,1,1	4

Considering a variety of degrees, a conceptual framework could distinguish between three types of subcategories. So far, I only spelled out the case of P_{max} , which would be represented by a conceptual schema that allows for varying degrees but still requires four necessary criteria. Unfortunately, following this strategy does not present a straightforward solution for the 255 instances, which would be captured by a disjunctive conceptual schema allowing varying degrees.

Trying to find a strategy to group and order all 255 instances, one is confronted with the problem that not all instances can be reasonably compared. This is what mathematicians call a partial order. Of course, claiming that the tuple (1,1,1,0) is „smaller“ than the tuple (3,3,3,0) or

stating that (3,3,3,0) is „bigger“ than (3,0,0,0) is not controversial. But how can we judge whether an instance being manifested by three criteria with a middle value (2,2,2,0) is „bigger,“ „equal,“ or „smaller“ than an instance realized by two strong criteria (3,3,0,0)?

From a mathematical point of view, one could decide first to apply the degree strategy and then use the criteria strategy (degree first) to order the instances entailed in the resulting subcategories. But you might as well start with forming subcategories along the criteria strategy and order entailed instances along the degree strategy (criteria first). Categorizing all instances first along the number of fulfilled criteria would result in the statement that (2,2,2,0) is „bigger“ than (3,3,0,0). Whereas applying the degree strategy first would lead to the statement that (2,2,2,0) turns out to be „equal“ to (3,3,0,0).

Both combinations of the two strategies can represent a mathematical but rather arbitrary solution. From my perspective, neither combination is really satisfying. Either one treats instances that differ in the number of criteria fulfilled as equal (degree strategy). Alternatively, instances that are characterized by a weak manifestation of their criteria, such as (1,1,1,0), are treated as "greater" than an instance in which fewer criteria are fulfilled but in strong manifestation (3,3,0,0). The crucial question is which qualitative considerations might be decisive for choosing one or the other strategy.

Returning to Real Concepts

This is the point at which one might tend to give up. Although it is an important step to aim for a conceptual framework to capture the diversity of socio-cognitive abilities, including the neglected instances described above, this is a very challenging project.

While the quantitative-mathematical perspective presented here could clearly show how many instances are neglected when following a dichotomous interpretation of a two-systems approach, it could not provide a clear solution when it comes to clarifying how such a conceptual framework might look in detail. Without considering the concrete conceptual context, one is not able to justify a decision which of the two strategies is appropriate.

However, this does not mean that one has to refrain from this project. After all, interdisciplinary research can produce findings that make it possible to structure the diversity of socio-cognitive phenomena into meaningful sub-areas. Then one can use the two-system approach to define the extrema of a continuum and obtain additional criteria for structuring the field in between. Instead of a dichotomous distinction of two areas, one can then develop a conceptual framework that defines in-between areas between the extrema.

Future research should return to practical examples to find a way in which qualitative considerations can help structure the many neglected instances between extreme cases. For example, in psychiatric diagnostic manuals, we have a case where both family resemblance and gradual variations play a role. To be diagnosed with a mental disorder, a person is

assumed to have a certain number of symptoms, and it also matters how severe the symptoms are. Considering such cases, it is necessary to discuss whether it is "worse" to have more symptoms in a weak expression than fewer symptoms in a strong expression.

Conclusion

This paper argued that the development and integration of minimal notions presents an important step in expanding the rather restrictive standard terminology of philosophy. Only with additional new minimal notions, philosophical terminology can capture the diversity of phenomena for which we have empirical findings. Only then it becomes possible to connect such empirical findings with theoretical work in philosophy.

However, up to now, it has not yet been conclusively determined how to integrate minimal notions into an overarching conceptual framework. An analysis of the widely used strategy to characterize the relationship between minimal and standard notions with reference to a two-system approach showed that, due to a dichotomous interpretation, many instances are still neglected.

A theoretical consideration analyzing a hypothetical, disjunctive conceptual schema called "*at least 1 of 4*," which allows for weak, medium, and strong expressions of the required criteria, demonstrated that the number of neglected instances is impressively high.

As an alternative, this paper suggests developing a disjunctive conceptual schema that can account for different manifestations of the criteria as well as for the variety of combinations of criteria. Attempts to structure the field of neglected instances in such a way as to provide a basis on which one can then develop a viable conceptual schema proved unsatisfactory. From a theoretical point of view, it is not clear how to deal with a partial order containing instances that are not comparable. On a theoretical level, it is impossible to justify a decision between the two developed ordering strategies (criteria first & degree first). To decide which strategy is appropriate, it seems appropriate to take into account qualitative considerations that can only arise from the concrete conceptual context.

This could be the starting point for a new interdisciplinary research project clarifying which ordering strategy should be chosen in which context. An empirically informed examination of different conceptual fields can provide insight into how the different factors should be weighted. In some contexts, it may turn out that the degree of criteria is more decisive than the number of fulfilled criteria. In other contexts, one may find reasons to give more weight to the number of criteria met.

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