

Chapter Ten Grasping Sameness¹

' 10.1 Introduction: Images of Identity

In *Subject and Predicate in Logic and Grammar*, Strawson (1974) offers "a picture or model" of what happens when a man learns that two things formerly thought to be separate are in fact one and the same. "We are to picture a [knowledge] map, as it were" on which all those individuals the man knows of are represented by dots, and the predicates the man knows to apply to each are written in lines emanating from these dots or, if the predicate is relational, lines joining two dots.

Now when [the man] receives what is for him new information...he incorporates [this] by ...making an alteration on his knowledge map [for example,] he draws a further line between two dots. But when it is an identity-statement containing two names from which he receives new information, he adds no further lines. He has at least enough lines already; at least enough lines and certainly one too many dots. So what he does is to eliminate one dot of the two, at the same time transferring to the remaining one...all those lines and names which attach to the eliminated dot. (Strawson 1974, pp. 54-55.)

On Strawson's picture, the identity of a particular is represented in the mind by the identity of another particular.² So long as you haven't made any mistakes, everything you know about your mother is attached to the same *particular* mental representation of your mother, to the same token. Your understanding that all these facts are facts about the same woman consists in the representations of the logical predicates of each of these facts being attached to numerically the same "dot" in your mind or brain. Call this the "Strawson model" of how identity or sameness is thought.

A more familiar model pictures thoughts each as a separate sentence token in a

1 Portions of this chapter were revised from "Images of Identity" (Millikan 1997b) with the kind permission of Oxford University Press and from "On unclear and indistinct ideas" (Millikan 1994) in Philosophical Perspectives, 8, Logic and Language with the kind permission of Ridgeview Publishing Company.

2 I will move back and forth between idioms appropriate to traditional thinking about minds, and idioms more appropriate to thinking about brains, on the assumption that the structural forms we will be comparing are abstract enough to justify this. Theories of thought inevitably proceed on the assumption that there are abstract analogies between how thoughts work and how more mundane things work or might work. Think, for example, of Plato's Theaetetus with its mind that talks to itself, its wax imprints and its birds, or to the classical tradition that ideas are "like" their causes or that ideas are "associated" in the mind, and so forth. My talk about "the Strawson model," "the Christmas lights model," "the synchrony model," and so forth, should be understood in the same spirit.

mental language. On this model the identity of a particular is represented by the identity of a mental word type rather than the identity of a token or particular. What Strawson would model using a single dot and two lines, a language of thought model renders as two different sentence tokens containing a word type in common, say, <Tom is married> and <Tom is harried>. Generalizing this to any system in which sameness is represented by duplication of form, we can speak of the "duplicates model" of how identity is represented. The use of this model should be carefully distinguished from the repetition view of the act of identifying, scouted in Chapter Nine. The duplicates model is a model of how identity is represented. The repetition view from Chapter Nine concerns what constitutes the act of reidentifying, that is, what constitutes that the mind understands a certain representation of identity as a representation of identity. Compare: I can represent a dog by drawing a picture of a dog or by writing down the word "dog" or by saying "dog." The question what it is for me to understand any of these as a representation of a dog is another matter entirely. It might be claimed, for example, that although the appearance of identical representational vehicles does not actually constitute an act of identifying, still a reasonable hypothesis about the mechanics of human conception is that our conceptual mechanisms have a compulsory disposition to perform acts of identifying over identical representational vehicles.

Another model of how identity might be represented, one also taken from language, is the "equals" model. Here a second marker, a mental equals sign, rides piggyback on the duplicates marker, indicating *examples* of two different duplicatable types. The effect of this "identity belief" is that all tokens of either exemplified type are then treated as representing the same.

An absorbing contemporary discussion among cognitive neurologists concerns the "binding problem," Neurological evidence indicates that various kinds of sensory information arriving from the same object, such as information about form, color, and direction of motion, are not processed in the same area of the brain but filtered through "widely disseminated feature-detecting neurons located even in different areas or cerebral hemispheres" (Engel 1993). How then is it represented that these various features belong to the same object, and not to entirely different objects merely co-present in the perceptual field? One hypothesis is that synchronous spiking in neural firing patterns on a millisecond time scale indicates which sets of neurons are responding to the same object. Roughly, cells that fire together purport to talk about the same object; identity is represented by synchrony. If identity might be represented this way in perception, why not also in thought? Call this the "synchrony model" of how identity is thought.

Connectionist explorations suggest as a crude model that units representing the same object might be strongly connected so that they tend to be activated together like Christmas tree lights on the same string. Then a certain causal connection would represent identity. Call this the "Christmas lights model" of how identity is thought.

Anaphoric pronouns, which occur in all natural languages, suggest a model according to which each representation of the same object bears some kind of pointing relation to prior representations of that same object. Call this the "anaphor model" of

how identity is thought.

And so forth.

Now it is strongly emphasized in the Fregean tradition that representing the same referent twice, representing it once and then again, must be carefully distinguished from representing it *as being* the same referent again. If someone represents Mark Twain to herself and then represents Samuel Clemens, she represents the same thing twice, but it does not follow that she represents or understands that these are the same. Reflection on the above models, combined with the reflections in Chapter Nine, shows that we should be equally careful to distinguish between representing the same thing twice *in the same way*, that is, duplicating a representation of it, and representing it *as being* the same thing again. If someone represents Mark Twain to herself in a certain way and then represents Mark Twain again in exactly the same way—*if she duplicates a representation of Mark Twain*—it does not follow that she represents or understands that the two referents are the same. To assume this would be either to embrace the passive picture view of the act of reidentifying, or else to beg the question how the mind or brain represents identity. If the latter, it would assume that *duplication* is used by the mind/brain as a sameness marker prior to any evidence that this is the case. There is no reason to suppose in advance that it is sameness *Clkeness*C that represents sameness.

Employing an example from perception, suppose that you observe the same individual apple in exactly the same context from exactly the same angle under exactly the same lighting conditions on two different occasions, and make exactly the same perceptual and cognitive response to it each time. Merely as such, this fact neither constitutes that you recognize the apple as being the same apple again, nor need it trigger or produce such a recognition, either perceptually or cognitively. On the other hand, there are relations other than duplication among percepts that mark object identity across time straightaway for the human perceiver, namely, the right continuities in perceived place and time. Given the right continuities, one's perception may be of an object as being the same one over a period of perceptual tracking despite its apparently changing in every one of its observed properties. This sort of tracking of an object, say, with the eyes, does not involve *repeating* some particular way of perceiving or thinking of the object, or repeating some way of recognizing it over and over. It is not repetition that constitutes or triggers perceptual grasp of identity.

What I have been saying about mental markers for identity of individuals also applies, of course, to markers for other kinds of sameness. Just as representing the same individual twice in the same way is not representing it as the same individual, representing the same property twice in the same way is not representing it as the same property—*not unless duplication happens to be what the system uses as its sameness marker for properties*. We cannot assume without evidence, for example, that whenever the same color, shape, or distance are represented in perception the same way twice, once on the left, say, and once on the right, one *ipso facto* recognizes these properties *as being* the same. Also recall, for example, the identifying of a heard with a seen direction. Although this kind of identifying is automatic, even compulsory, it is implausible

that an identity in vehicles triggers it. Recall also that we can learn to perceive hitherto unrecognized identities directly or compulsorily via perceptual learning. It seems implausible that the vehicles of perception are somehow changed accordingly so that they now match.

A system of thought might also use different sameness markers for different kinds of identities. As Strawson described his own model, the sameness markers for predicates were not what I have called "Strawson markers," but were duplicates markers.

In this chapter, I propose to address the question what would *constitute* that a mind or a brain was using one method of marking sameness rather than another.

' 10.2 Locating the Sameness Markers in Thought

Suppose that the cognitive neurologist or God looks down into the mind/brain with an eye to deciphering which of its various states or events are the ones representing identities. How is the neurologist or God to tell, given a mind in motion, *how* it is thinking identities?

First, we might ask, on what evidence do neurologists *in fact* suppose that synchrony may be the brain's marker of identity for perceived objects? The evidence they give is that synchrony is in fact found (in monkeys and cats) among cells responding to the various properties of numerically the same visually presented objects. At least within the more accessible visually involved layers of the brain, information about one and only one individual object feeds into one synchrony, information about others into other synchronies.

Generalizing the neurologist's method suggests that evidence for some feature being the sameness marker used by a system is that information derived from the same thing in the environment systematically shows up marked by this marker. Thus, evidence for Strawson's model would be that all and only structures bearing information derived from numerically the same environmental source showed up attached to numerically the same something-or-other in the brain or mind; evidence for the duplicates model would be that all and only structures bearing information derived from numerically the same source showed up attached to structures alike by some specified principle of likeness, and so forth.

There is an obvious problem with this method, nor has it escaped notice by the neurologists (e.g., Singer 1995). Synchrony among neuronal firings caused by the same object may be only a byproduct of the brain's perceptual activities. That these neurons fire synchronously may have no connection with any cognitive work done by the brain. That a bit of natural information about sameness of source resides in the brain does not prove that the brain *uses* or *understands* this information, any more than the presence of natural information in the sky carried by black clouds proves that the sky thinks it will rain.

Compare the hypothesis that certain neurons in the visual system are "feature detectors." The circuitry that produces firing of such neurons may seem to be intricately specialized to support this function, but the final proof must demonstrate that the firings are *used* as feature detectors, that is, that the information collected by them actually

guides the organism to take account of the features apparently detected. Similarly, for whatever is found in the brain or mind that appears to be a sameness marker. What the neurologists would like to show is that synchrony is not just a natural indicator of sameness, but is effective in guiding thought and action to take account of the indicated sameness. It appears then that we must start further back. We must ask, what is involved in *using* a marker as a sameness marker? What does a mind have to do in order to manifest understanding of its own sameness markers? In what kind of way does one's mind have to move in order to grasp an identity?

Begin by asking, what is the point of grasping identity? What does one do with a knowledge of identity? Why should it matter to any organism whether or not various pieces of information that it has acquired are about the same object or about different objects? Suppose that I recognize for the first time that Cicero is Tully. What am I able to do that I was not able to do before? Well, if I knew before that Cicero was bald, I now also know that Tully was bald. And how does that change anything, that I now know that Tully was bald? After all, I already knew that Cicero was bald and that was exactly the same thing to know. Why not be satisfied with knowing some things about Cicero under one idea of him, other things under other ideas of him, even if I don't know that these ideas grasp the same? So long as I pack all the right information in one way or another, why does it matter (putting things in familiar duplicates-model terminology) what notation I use? Why does an organism need to have sameness markers in perception or thought?

It matters because if I don't recognize the identity of Cicero with Tully, then I cannot combine the various things that I know about this man, Cicero/Tully, so as to yield anything new. I cannot perform mediate inferences using the thought of Cicero/Tully as a middle term. Taking a mundane and more general example, suppose that I perceive that \hat{a} is orange and that \hat{a} is round and that \hat{a} smells sweet and that \hat{a} is fist-sized and that \hat{a} is within reach. Why does it matter whether $\hat{a}=\hat{a}$, or whether $\hat{a}=\hat{a}$, and so forth? Because if $\hat{a}=\hat{a}=\hat{a}=\hat{a}=\hat{a}$, but only then, probably this is a reachable orange, hence can provide me nourishment. Only by using these various bits of information *together* can this understanding be reached. But these bits can be used together legitimately only if they all carry information about the same. Suppose that I believe that A is smaller than B and that C is smaller than D. Only if I also grasp both that B=C, and also that the thought smaller than has the same content in both beliefs, can I make an inference: A is smaller than D.

Some middle terms are predicative (A is smaller than B and B is smaller than C...) and some are propositional rather than denotative (if P then Q, and P, therefore Q) but there is always at least one repeated element involved in an amplificatory inference. Again, suppose that I believe that Cicero is bald but that Tully is not. Only if I also understand both that Cicero=Tully and that the thought bald has the same content in both beliefs can I discover that I am involved in a contradiction. Consider a person manipulating symbols to derive theorems in a logical system. In such a system, identity is marked, primarily, by duplication. Does such a person do the same thing again whenever the same referential symbol is encountered again? The reaction depends,

rather, on the context in which the representation is found, reactions being, paradigmatically, to pairs of strings, which the reader combines to yield a third. Such combinings invariably require an overlap in the two strings, a "middle term." The middle term has to be duplicated in the two premises for a rule of mediate inference to apply.

Nor do we need the image of a language of thought in order to grasp the role that reidentifying plays in amplifying information. Imagine a creature that carries mental maps of various places it has been about in its head. It has a map of the locale in which it last found water, and another of the locale in which it last saw lions. On each of these maps its den is marked. Now imagine that it overlaps these maps, using its den as a pivot, and arrives at a third map showing the proximity of lions to the source of water. Guided by this new map, it seeks a new source of water rather than going back to the lion-infested source on its map. As is characteristic of all mediate inference, two vehicles of information have been combined, pivoting on a middle term, an overlap, so as to produce a third vehicle containing new information. Thus our creature exhibits a grasp of the sameness in content of the two representations of his den that were on the two original maps.

More basic even than the involvement of identifying in theoretical inference is its involvement in practical inference, action, and learning. It is only through recognizing the identity of an item currently perceived with an item known or perceived earlier that what was learned earlier can be joined with what is perceived now to yield informed action. Suppose that I wish to congratulate A on his engagement and that I see that B is in the lounge talking to C. This seeing will be of no use to me unless I grasp whether $A=B$ or $A=C$. Consider learning. Suppose baby has noticed that A scolded her when she cried but that B, C and D kindly picked her up. Whether she learns anything from this will depend on which if any of these four she takes to be the same person again.

Returning to Evans' speculations on Molyneux's question and behavioral space ('9.3), it is not a person's ability to be motorically guided in the same way by perceptions from different sensory modalities that would manifest grasp of sameness of content represented through these modalities. Rather, such a grasp would be manifested in the ability to combine information obtained through these different modalities to yield behavior or thought guided by both put together. Or, taking a different sort of example, consider a duckling that has imprinted on its mother. The result of imprinting is that whenever the duckling sees its mother, a certain set of behavioral dispositions emerges. The duckling has stored away a "template" matching its mother's appearance so as to "recognize" her. Despite our natural use of the term "recognize" in this context, it does not follow (though it may of course happen to be true) that the duckling reidentifies its mother (for example, that it has a substance concept of her). Only in so far as the duckling is capable of learning things about its mother on some encounters to apply on other encounters with her does it identify her. Just reacting the same to her time after time does not indicate identification.

Every mediate inference, every recognition of a contradiction, everything learned either from perception or inference and applied in action, every belief or behavior issuing from coordination among sensory modalities, for example, eye-hand coordination, even

such subpersonal activities as the use of images from two eyes in depth perception, depends upon recognition of content sameness. Grasp of identity is the pivot on which every exercise of perception and thought must turn that collects together different pieces of information from different perceptual modalities, or from different contexts, or over time, and effects its interaction. Every act of identifying is thus implicitly an act of reidentifying, consisting in the use of two or more representations or pieces of information together. Described on the level of content, on the level of the visagings or believings-that involved, we call these "acts of identifying" or "reidentifying." Described on the level of the vehicles or mental bearers of information involved, we can call them acts of "coidentifying." In an act of coidentifying, two representational vehicles are employed together in a manner that assumes, that is, requires for correctness, an overlap or partial identity in content, thus effecting an act of reidentifying of content.

' 10.3 Substance Concepts and Acts of Reidentifying

The thesis of ' 10.2 can be put as follows:

For a perceiver or cognizer to reidentify something JUST IS to be disposed, or for some subsystem of theirs to be disposed, to pair representations of that thing in perception and/or thought as a middle term for mediate inference, or other amplificatory information-processing, and/or for guiding action.

That will do for a first pass over the phenomenon of recognizing sameness.

A second pass must take into account that where valid mediate inferences are made, or correct content-sameness pairings or groupings are made for other information-using purposes, this result must follow from some kind of indication in the initial or "premise" representations of where sameness of reference is occurring. It must result from a system or systems of sameness marking in perception and thought Cperhaps using Strawson-style markers, and/or duplicates markers, and/or Christmas light markers, and so forth.

What makes a marker a sameness marker is that the perceptual/cognitive systems use it to control the mediate inferences and other content pairings that they make in guiding amplificatory information-processing and action.

Derivatively, then, the mere occurrence of an appropriate sameness marker connecting two perceptions or thoughts can count as an "understanding" that the marked representations are representations of the same. It is, as it were, a "first act understanding of sameness," where a "second act understanding" is an actual process of mediate inference, amplificatory information processing, or action guidance controlled by these markers. First act identifications, sameness markings, prepare for second act identifications.

Suppose that in the case of thoughts of substances, we were to take first act identifications to be "applications of substance concepts." That is, "applying a substance

concept" would be marking incoming information in such a way that its bearers will be ready for coidentification with certain other information bearers. "Applying a substance concept" will be readying bearers of incoming information for interaction with a restricted set of other information bearers (those bearing information about the same substance). Then there will be, after all, a sense in which "applying the same substance concept" counts as an act of identifying or recognizing sameness. But this sense of "substance concept" will be that in which the abilities that are substance concepts are counted or individuated by their ends, not their means. Substance concepts must be scrupulously distinguished from conceptions of substances (' ' 1.9, 4.8, and 6.3) in this context.

A third pass over the question what it is for content sameness to be recognized in thought should take error into account. Under unfavorable conditions, even simple perceptual identification tasks can be mismanaged. For example, there is a way of crossing your fingers so that the identity markings that bridge between tactile and visual percepts become mixed. The finger one sees being touched does not seem to be the finger one feels being touched. When looking through a stereoscope your visual systems misidentify portions of two pictures as portions of the same, thus producing the illusion that you are looking at a three dimensional scene. The skill of sleight-of-hand artists depends largely on their ability to fool your visual systems into failing to track objects correctly, thus inducing perceptual misidentifications.

Such misidentifications do not occur commonly, and may require specially designed apparatuses or other circumstances of perception to induce them. Conceptual responses to the data of sense, on the other hand, are more tenuously correlated with affairs in the world than are perceptual responses. Failure to mark sameness correctly in thought is quite common. We often fail to recognize a thing, or we confuse two things together, say, mistaking Jim for Bill or failing to distinguish between mass and weight. Consider, then, a mediate inference that is made over two premises containing information in fact derived from different sources. The premises do not carry information concerning the same thing, and as a result, let us suppose, the conclusion arrived at is false. Should such an erroneous move count as a mistake in inference? Or should it count merely as a mistake in data collection and labeling?

Which internal moves should count as valid inferences would seem to depend on how sameness of origin is marked during data collection. But how sameness of origin should be marked during data collection surely depends on what sameness markers the inferencing systems will recognize. There will be nothing wrong, for example, with representing two different objects with identical representations so long as duplication is not the identity marker. Does it follow that which structures really are the sameness markers is well defined only for a system that never makes mistakes?

This kind of problem is classic, of course, for theories of naturalized thought-content. These theories typically take cognitive abilities to be some kind of dispositions (Chapter 4), or to rest on ceteris paribus laws. The problem is then taken to concern "idealization." How far away from a certain ideal can a system's actual practice or actual dispositions be while still counting as an example of a given ideal type? What do we say about content when the system hovers indeterminately between or among alternative

ideal types?

My own preference is to refer instead to evolutionary design on this sort of question (Millikan 1984, 1993a, in press b). There will be ways that our perceptual-cognitive systems worked when they operated such as to be selected for by natural selection. There will be a way or ways, that is, that they were "designed" to mark and to recognize sameness. With enough knowledge of the internal mechanisms controlling cognition, what these normal ways are should be no harder for us to distinguish than, say, how the human eye is designed to work, even though many human eyes function poorly. The distinction between having gone wrong in collecting the data and having gone wrong in inference may then be a perfectly objective distinction.

Thus there is room to distinguish two kinds of error, either of which might be called an error of misidentification. There could be error in performing a first act identification, that is, an error in the labeling of incoming data. Or there could be an error in second act identification, an error in mediate inference, or an analogue, of the general sort traditionally labeled "the fallacy of the fourth term." The first would be an error in the fixation of belief, the second an error in inference or an analogue of inference. I will not try very hard to keep these possibilities distinct in the chapters that follow, though occasionally it will be helpful to recall their difference.