3

Gestalt Structure as a Constraint on Meaning

We have begun to explore the way in which image-schematic structures of experience generate complex patterns of meaning. I used as an example one of the most pervasive features of human experience, namely, the experience of containment, boundedness, and differentiation. I argued that there are recurrent patterns in these "containment" experiences and that the patterns could be extended, transformed, and metaphorically projected to give the meaning of *out* for many of its different (but related) senses. In other words, the analysis of *out* highlighted the nonpropositional and embodied nature of the image schemata for containment and boundedness.

I now want to redirect our attention toward the *internal structure* of these experiential schemata. I shall emphasize their *gestalt* characteristics, that is, their nature as coherent, meaningful, unified wholes within our experience and cognition. They are a principle means by which we achieve meaning structure. They generate coherence for, establish unity within, and constrain our network of meaning. Most important, these "experiential gestalts" are neither arbitrary, nor are they "mushy" forms that have no internal structure.

To explain and defend my case, I shall examine a second, ever-present dimension of our experience, that of forceful interaction. The previously described schemata for CONTAINMENT gave prominence to the limitation, restriction, and channeling of forces. By paying more attention to our experience of force as such, we uncover new considerations that did not arise in the analysis of boundedness. These considerations include motion, directedness of action, degree of intensity,

and structure of causal interaction (including notions of both agency and patienthood, for animate and inanimate things alike). These new factors constitute further kinds of internal structure that an image schema (as gestalt) might manifest. So, attending to the patterns of our forceful encounters not only enriches our sketch of the contours of experience, it also serves to show just how much structure and constraining form is present in typical image-schematic gestalts.

Preconceptual Gestalts for Force

In order to survive as organisms, we must interact with our environment. All such causal interaction requires the exertion of *force,* either as we act upon other objects, or as we are acted upon by them. Therefore, in our efforts at comprehending our experience, structures of force come to play a central role. Since our experience is held together by forceful activity, our web of meanings is connected by the structures of such activity.

I want to explore the way in which patterns of typical experiences of force work their way up into our system of meaning and into the structure of our expression and communication. The main evidence for the efficacy of these image-schematic gestalt structures will be a demonstration of the way they constrain and limit meaning as well as patterns of inference in our reasoning.

To begin with, let us look at some of the more obvious structures of our forceful encounters with other objects and persons. Because force is *everywhere,* we tend to take it for granted and to overlook the nature of its operation. We easily forget that our bodies are clusters of forces and that *every* event of which we are a part consists, minimally, of forces in interaction. However, a moment's reflection reveals that our daily reality is one massive series of forceful causal sequences. We *do* notice such forces when they are extraordinarily strong, or when they are not balanced off by other forces. For example, I usually pay no attention to the wind, unless it is so strong that it resists my progress as I walk. Only then do I become aware of its force. Likewise, gravity is a force so pervasive that I am seldom aware of it. But we need only encounter a hill in our daily stroll to feel the existence of this force, as if we are suddenly being pulled back.

Even though we do not tend to pay attention to the forces that are everywhere inside us and in our environment, it is clear that these forces manifest structures that are very much a part of our having co-

herent, meaningful experiences that we can call into consciousness, understand, reason about, and communicate in language. Before I identify the image schemata for some of the more experientially important force structures that bear on semantics and the structure of our conceptual systems, I want to focus briefly on a number of features that typically play a role in our sense of force.

First, force is always experienced through *interaction.* We become aware of force as it affects us or some object in our perceptual field. When you enter an unfamiliar dark room and bump into the edge of a table, you are experiencing the interactional character of force. When you eat too much the ingested food presses outward on your tautly stretched stomach. There is no schema for force that does not involve interaction, or potential interaction.

Second, our experience of force usually involves the movement of some object (mass) through space in some direction. In other words, force has a *vector* quality, a directionality. There may actually be a moving object, or there may be only a force exerted against an object that is not moved or changed. But, in either case, the force is exerted in one or more directions. As the baseball flies through the air, it traces a path that we can describe by a force vector, or series of vectors, leading from the pitcher to the catcher. Or when the baby simply moves its hand to grasp a rattle, there is force exerted in a direction.

Third, there is typically a single *path of motion.* This is tied up with the vector quality of forceful movement. Our prototypical schema would have the force vector moving along a path, or moving an object along a path. The fly traces an agitated path as it buzzes wildly from wall to ceiling to lamp and back to ceiling. The force of gravity pulls a leaf along a path toward the ground, until that path is terminated when another object (e.g., the ground) counteracts the gravitational force. In less prototypical cases, such as explosions, the force moves off in all directions creating a potentially infinite number of paths. We would get a definite path only by focusing on the force as exerted on one object moved by the explosion.

Fourth, forces have *origins* or *sources,* and because they are directional, agents can direct them to *targets.* The cup doesn't just move of its own accord—it moves because something with power moves it from the table to the lips and back to the table. The force that moved the cup came from somewhere and, in this case, moved it to a target or goal.

Fifth, forces have *degrees of power or intensity.* Where there is power there exists the possibility of measuring the force it generates. In some

cases, such as physical forces, this can be done rather precisely and quantitatively; in other cases, we may be able to give only a relative ranking, such as saying that force X is stronger than force Y. No matter how mathematically quantifiable a force is, the fact remains that being a force entails having a certain intensity.

Sixth, because we experience force via interaction, there is always a *structure or sequence of causality* involved. The door closes because I, or the wind, or a spring mechanism, acted on it to cause it to shut. Forces are the means by which we achieve causal interactions. The agent of the causal sequence can be either an animate and purposive being, or it can be a mere inanimate object or event; but in either case the relevant forces are always actual or potential forces in an actual or potential sequence of causal interactions. In other words, although we can think of forces abstractly in isolation as bare force vectors, all actual forces are experienced by us in causal sequences.

What I have just described is a general *gestalt structure* for force. I am using the term "gestalt structure" to mean an organized, unified whole within our experience and understanding that manifests a repeatable pattern or structure. Some people use the term "gestalt" to mean a mere form or shape with no internal structure. In contrast to such a view, my entire project rests on showing that experiential gestalts have internal structure that connects up aspects of our experience and leads to inferences in our conceptual system.

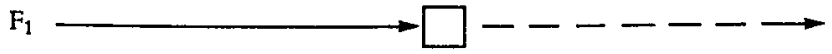
What I am calling "image schemata" in this book are all gestalt structures, in the sense just described. Any given schema can, of course, be analyzed and broken down simply because it has parts. But any such reduction will destroy the integrity of the gestalt, that is, will destroy the meaningful unity that makes it the particular gestalt that it is. Throughout this book I am assuming that all image schemata are characterizable as irreducible gestalts. However, I presuppose this with the recognition that there are other kinds of gestalt structure besides schemata. For example, there are gestalts for complex categorical structures, for metaphorical projections, and for unified narrative patterns.

The gestalt I described earlier is a gestalt for forceful interactions. It lays out the elements and their connections that typically hold where some force operates on some object. One of the main claims of this book is that meaning (both in the broad sense that I am using the term and in its more narrow sense, as linguistic meaning) is often carried by gestalt structures of this sort. However, the structure I have described above is too general and a bit too abstract. We need to explore more concretely how forceful bodily experiences give rise to image-schematic

structures of meaning that can be transformed, extended, and elaborated into domains of meaning that are not strictly tied to the body (such as social interactions, rational argument, and moral deliberation). What I want to do, then, is to identify some more specific image-schematic gestalts for *force* and *force relationships,* to look at particular force schemata in order to see how they can play a role in the development of meaning and inference patterns. I shall first describe and diagram several such force schemata and then explore some of the semantic and speech act domains where these structures play a central role.

The following schemata represent seven of the most common force structures that operate constantly in our experience:

1. *Compulsion.* Everyone knows the experience of being moved by external forces, such as wind, water, physical objects, and other people. When a crowd starts pushing, you are moved along a path you may not have chosen, by a force you seem unable to resist. Sometimes the force is irresistible, such as when the crowd gets completely out of control; other times the force can be counteracted, or modified. In such cases of compulsion, the force comes from somewhere, has a given magnitude, moves along a path, and has a direction. We can represent this image-schematic gestalt structure with the visual image below. Here the dark arrow represents an actual force vector and the broken arrow denotes a potential force vector or trajectory.



COMPULSION

2. *Blockage.* In our attempts to interact forcefully with objects and persons in our environment, we often encounter obstacles that block or resist our force. When a baby learns to crawl, for instance, it encounters a wall that blocks its further progress in some direction. The baby must either stop, ceasing its exertion of force in the initial direction, or it must redirect its force. It can try to go over the obstacle, around it, or even through it, where there is sufficient power to do so. In such a case the child is learning part of the *meaning* of force and of forceful resistance in the most immediate way. This experience of blockage involves a pattern that is repeated over and over again throughout our lives. The relevant gestalt can be represented as a force vector encountering a barrier and then taking any number of possible directions (fig. 7).

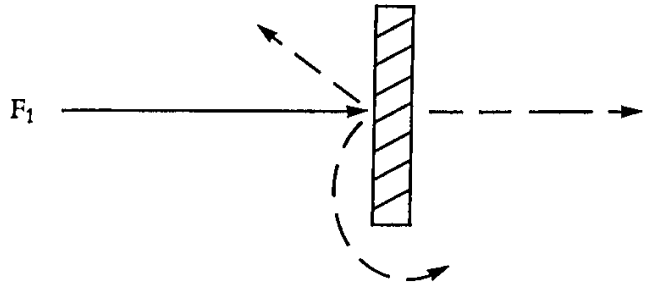


FIGURE 7. BLOCKAGE

3. *Counterforce.* A third cluster of gestalts focuses on the head-on meetings of forces (fig. 8). Football linemen are most familiar with this force gestalt. Here two equally strong, nasty, and determined force centers collide face-to-face, with the result that neither can go anywhere. Lucky survivors of head-on auto accidents also know the meaning of this particular structure of force.

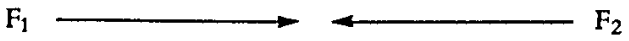


FIGURE 8. COUNTERFORCE

4. *Diversion.* A variation on the previous gestalt is one in which a force vector is diverted as the result of the causal interaction of two or more vectors. If you have ever tried to row a boat at some angle oblique to the wind, you know that, without compensation in your rowing, your initial force vector is lost before you know it. The appropriate schema shows two colliding forces with a resultant change in force vectors (fig. 9).

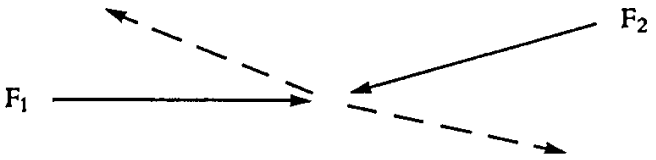


FIGURE 9. DIVERSION

5. *Removal of restraint.* When the door is opened, we are free to come into the room. When the fence is taken away, the dog can visit its canine neighbors, if it so chooses. The removal of a barrier or the absence of some potential restraint is a structure of experience that we encounter daily. The relevant schema is thus one that suggests an open way or path, which makes possible an exertion of force. In figure 10 the force F_1 is not the source of the removal of the restraining barrier. More properly that would be a special case of the BLOCKAGE schema

described in 3 above. Instead, the diagram is meant to suggest that, either because some actual barrier is removed by another or because a potential barrier is not actually present, the force F_1 can be exerted (i.e., there is nothing blocking it).

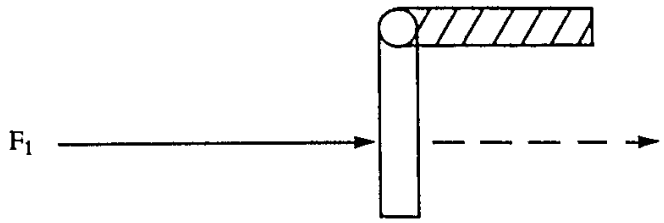


FIGURE 10. REMOVAL OF RESTRAINT

6. *Enablement.* If you choose to focus on your acts of manipulation and movement, you can become aware of a felt sense of power (or lack of power) to perform some action. You can sense that you have the power to pick up the baby, the groceries, and the broom but not to lift the front end of your car. While there is no actualized force vector here, it is legitimate to include this structure of possibility in our common gestalts for force, since there are potential force vectors present, and there is a definite "directedness" (or potential path of motion) present. That is, you feel able to move the chair *over to the corner,* or to lift the comb *up to your hair.* The gestalt is represented, then, only by a potential force vector and an absence of barriers or blocking counterforces (fig. 11).

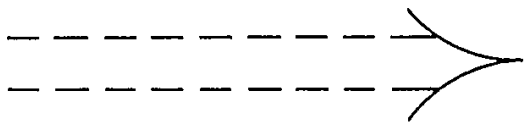


FIGURE 11. ENABLEMENT

7. *Attraction.* A magnet draws a piece of steel toward itself, a vacuum cleaner pulls dirt into itself, and the earth pulls us back down when we jump. There is a common schematic structure of attraction shared by these experiences. This same structure is present, too, when we feel ourselves physically attracted to some other person. The force is not gravitational, in the standard sense, but it is a kind of gravitation

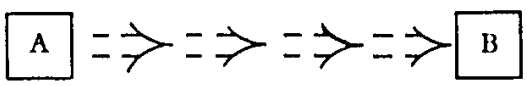


FIGURE 12. ATTRACTION

toward an object. As such, it shares the same underlying ATTRACTION schema (fig. 12). The vectors here can be either actual or potential, and there might be additional objects added to represent more complex relations of attraction.

The previous list of distinct force gestalts is only a selection of the more important image schemata that play a role in our experience of force. A more complete list, for example, would have to distinguish among schemata for IMPACT versus CONTINUOUS STEADY FORCE versus INTERMITTENT FORCE versus DIMINISHING FORCE, and so on. But this small sample already shows us something extremely important about our experience, namely, that aspects of its meaningfulness and coherence depend upon certain *very definite, highly structured* image-schematic gestalts. Their structure is not elaborate, but it is sufficiently distinct to give comprehensible order to our perceptions, understanding, and actions.

Let us now explore the way in which image schemata of this sort play their indispensable and pervasive role in the development of meaning for us, and in our patterns of understanding and reasoning. In particular, I want to focus on our experience of force and on its structure as it connects up certain parts of our meaning network, our conceptual system, and our language.

Force Gestalts in the Root Senses of Modal Verbs

The experiential (image-schematic) gestalts for force that I have just described are actual repeatable structures of experience that emerge from our forceful interactions in our world. These patterns exist for us prelinguistically, though they can be considerably refined and elaborated as a result of the acquisition of language and the conceptual system that language makes possible. These structures are part of meaning and understanding. They do not merely form a background against which meaning emerges; rather, they *are themselves meaning structures.*

In order to amplify this key point, I am going to discuss a body of recent empirical work on the semantics of modal verbs that has important implications for my account of schemata. Modal verbs, such as *can, may, must, could, might,* are verbs that pertain to our experience of actuality, possibility, and necessity. It might appear that modality is a very abstract and esoteric subject for a study like mine, which claims to focus on basic structures of common human experience. And, if one looks at the massive philosophical literature on modality, this sus-

picion seems justified. There modality is treated as a purely logical notion, one that concerns logical possibility and necessity. In these logical discussions one finds inquiries into the nature of terms such as "possible" and "necessary" in statements of the following sort: "It is necessary that p = it is impossible that not-p = it is not possible that not-p," and, "It is necessary that not-p = it is impossible that p = it is not possible that p."

In contrast with this logical analysis of modality, there are other senses of modal verbs that are intimately related to our everyday experience, insofar as they represent our pervasive experience of things, events, and relations as being actual, possible, or necessary. To the extent that we experience our world via these three categories of existence, their schemata are crucial to our understanding of our experience. For instance, the modality of possibility is present in our experience of alternative actions open to us in a given situation. We feel the possibility of performing act A, act B, act C, etc., as options that are not necessitated. At other times we experience necessity with all its compelling force, as when shutting off the power causes the motor to stop, or the anesthetic makes us drowsy. Modality is an ineliminable part of our world.

So, the inquiry we are about to undertake into the meaning of certain modal verbs is actually an investigation into a further cluster of extremely significant patterns of experience and understanding. When we inquire into the senses of must, may, and can, we are exploring the image schemata present in situations of the sort we encounter daily: feeling ourselves able to act in certain ways (*can*), permitted to perform actions of our choosing (*may*), and compelled by forces beyond our control (*must*). We will see that there are other major senses of modal verbs besides their logical senses; and we will see that all of these senses are connected and related by virtue of force schemata.

The empirical research I shall be analyzing is taken from a far more extensive, careful, and sophisticated study of modals by Eve Sweetser.[1] Sweetser's treatment of modal verbs is part of a much larger project in which she examines connections among three related dimensions of experience: (1) the *sociophysical* realm that includes physical interactions as well as social relations, practices, and institutions; (2) the *epistemic* realm of rational argument, theorizing, and other activities of reasoning; and (3) the *structure of speech acts*. Sweetser's central thesis is that a pervasive, coherently structured system of metaphors underlies and relates these three realms of experience. The most general metaphorical structure that establishes these connections is one that under-

stands the mental, epistemic, and rational in terms of the physical. This BODY FOR MIND metaphorical structure both guides the course of semantic change through history (diachronically) and provides connections among some senses of polysemous words within a language (synchronically).

What is most relevant to our concerns with schematic structures of meaning is Sweetser's argument that the different senses of modal verbs are related by metaphorical structures, in which the physical becomes a metaphor for the nonphysical (the mental, rational, social). Sweetser distinguishes roughly between two different senses of modal verbs, namely, the *root* and *epistemic* senses:

i) *Root* modals denote ability (*can*), permission (*may*), or obligation (*must*) in our sociophysical world. The origin of the capacity, permission, or obligation has to do either with physical constraints and forces (natural causes) or else with social restrictions or commitments (social forces). Examples of the *root* senses of modals are:

(1) You *must* move your foot, or the car will crush it. (Physical necessity.)

(2) Sally *can* reach the fried eel for you. (She is physically capable of reaching it.)

(3) Paul *must* get a job now, or else his wife will leave him. (Paul is forced, by his wife's threat, to find a job, though the compulsion is not physical.)

(4) You *may* now kiss the bride. (No social or institutional barrier any longer prevents you from kissing her.)

The notion of *root* modality is broader than, and includes, that of *deontic* modality, which tends to be associated by philosophers with the more narrow notion of social or moral obligation alone.

ii) The *epistemic* sense of modality denotes probability, possibility, or necessity in reasoning, as in:

(5) Paul *must* have gotten the job, or else he couldn't be buying that new car. (Read as, "The available evidence forces me to conclude that Paul got the job.")

(6) You *might* be right about her motives, but I'm not convinced. (Read as, "No evidence blocks your conclusion, but neither does the evidence compel me to your conclusion.")

Sweetser's thesis regarding the connection of these two senses is that

> root modal meanings are extended to the epistemic domain precisely because we generally use the language of the external world to apply to the internal mental world, which is metaphorically structured as parallel to that external world.[2]

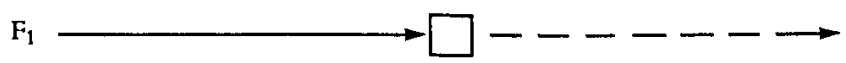
In other words, Sweetser argues that the meanings of verbs such as *can, may,* and *might* as applied to the physical (and social) realm are not radically different from their meanings when used in the realm of rational argument and reasoning. This claim to semantic connection stands in contrast to the standard view that the root and epistemic senses are not related in any systematic way.[3] The received opinion is that root meanings of terms like *must, may, might, can,* and so forth, do involve notions of force or obligation, whereas epistemic senses of those terms are seen as involving only combinations of logical operators. In short, the root and epistemic occurrences are taken to be homonymous.

As an alternative to such homonymy approaches, it seems at least reasonable to look for possible connections between different senses that are marked by the *same* word or phrase. Leonard Talmy opened the way for such an interpretation of modals with his argument that root modality can be understood by relating it to our experience of physical forces acting in the presence or absence of barriers.[4]

Sweetser has extended Talmy's analysis to epistemic modals and has focused on the sociophysical level of intentional action as experientially more basic than the purely physical level of causally interacting objects, which Talmy takes as basic. Drawing heavily on Sweetser's analysis, I want to consider three of the most central modal verbs (*must, may, can*), selected from the large range of modals she has examined.[5] My primary contribution will be to suggest that the relevant notions of force needed to explain modal verbs can be best understood as image-schematic FORCE gestalts.

To begin, a brief account of the root senses of *must, may,* and *can* is necessary before we can explore their relation to the epistemic senses.

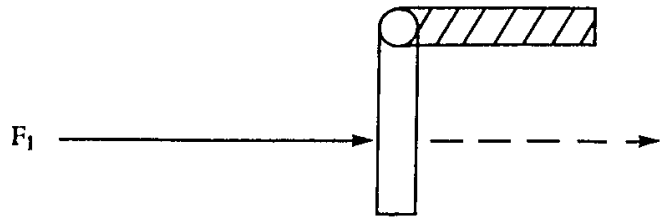
A. *Must.* Sweetser analyzes the root sense of *must* as denoting a compelling force that moves a subject toward an act. But this sense matches precisely the image schema for COMPULSION that I described earlier. Given this image schema, the force can be interpreted in different ways. It may be physical force, as in (1); parental authority, as in (2); "peer pressure," as in (3); or moral authority understood as a universal force acting on the human will, as in (4).



COMPULSION

(1) You *must* cover your eyes, or they'll be burned.
(2) Johnny *must* go to bed; his mother said so.
(3) He *must* help in the blood drive, or his friends won't respect him.
(4) She *must* give blood; it's her duty.

B. *May*. *May* is understood as absence of external or internal restraint or compulsion. There is no barrier blocking the occurrence or performance of some action. This root sense is based on the ABSENCE OR REMOVAL OF RESTRAINT schema. To say that a certain action *may* be done implies that some potential barrier to the action is absent or has been removed. We only use *may* regarding actions or events that might be either blocked or compelled by an external obstacle or force. In (5), then, an event (a cure) is not blocked by any known state of affairs.



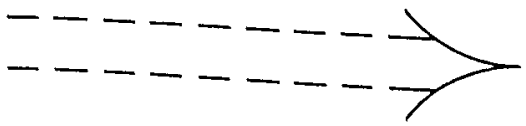
REMOVAL OF RESTRAINT

(5) We *may* be able to cure his illness.

In (6) an act (opening the window) is permitted that could have been prohibited, and has previously been prohibited, either by external physical force or by the force of social or moral authority.

(6) You *may* now open the window, if you like.

C. *Can*. *Can* is more problematic and controversial. Sweetser explains its difference from *may* as follows: "*Can* denotes positive ability on the part of the doer; *may* denotes lack of restriction on the part of someone else."[6] *Can* thus involves a sense of internal power or capacity to act. The agent is a source of energy sufficient to perform some action. Although *can* tends to assume an absence of restricting barriers, its primary focus is on *potentiality* or *capacity to act*. *Can* would, therefore, seem to require its own distinct gestalt, one for ENABLEMENT, consisting only of a potential force vector. With *may* we emphasize and focus on the removal of potential or actual barriers, but with *can* we focus on the potential energy to act. Thus, in (7) the focus is on the removal of restraint by someone else, but in (8) the focus shifts to the internal sense of power to act.



ENABLEMENT

(7) You *may* go anytime after the bell rings.
(8) I *can* do anything you *can* do better.

Epistemic Senses for Modal Verbs

The epistemic sense of modals, such as *must, may,* and *can,* find their home in the domain of reasoning, argument, and theorizing. Following Sweetser, I am claiming that the epistemic senses are intimately connected with their root senses and that the basis for this connection is that we understand the mental in terms of the physical, the mind in terms of bodily experience. In particular, we understand mental processes of reasoning as involving forces and barriers analogous to physical and social forces and obstacles. To explore this hypothesis, let us consider whether gestalt structures for force operate in the epistemic domain in ways parallel to their operation in the sociophysical domain.

The key to identifying the connections between the root and epistemic senses is the metaphorical interpretation of *force* and *barrier.* In the domain of social obligations and expectations the relevant forces are exerted upon us either by other people, by institutions, or by what we might call a "universal voice." That voice is typically understood as conscience or moral law. It is this moral sense that is most akin to the voice or permission-granter that operates in the epistemic realm. Sweetser argues that the only possible source of force in the epistemic world is premises (or available evidence); and only premises (or evidence and facts) can constitute barriers capable of blocking the force of a reasoning process. So, Sweetser thinks that there is no genuine "permission-granter" in the epistemic realm in the way there is for the sociophysical realm.

This is surely correct if we hold to our folk theories about reasoning and if we stick to the linguistic evidence. But I would note that there is a philosophical tradition that implies the existence of a permission-granter, even in the epistemic realm. In many Western philosophical treatments of knowledge, rationality, and truth, there is an underlying metaphorical conception of a universal voice that grants permission to

move from premises to validly derived conclusions. This is the voice of pure reason. To reason correctly is to speak in agreement with this universal voice. In certain theologically oriented traditions this voice is identified with the "Mind of God," so that reasoning well is being in tune with the Divine Logos. In nontheological traditions this voice is reinterpreted as that of a universal reason, which provides a *logos* to which our reason should conform.

Whether or not there is a permission-granter in the epistemic domain, Sweetser is correct in claiming that it is the *premises* of the argument that do all of the work and that force us along a path toward some conclusion. As Lakoff and I argued concerning the metaphorical structuring of the epistemic domain, one of the chief metaphors for argument and reasoning in our culture involves motion along a path toward some destination (conclusion).[7] Various propositions can block our journey, can help us along our way, can throw us off our path, and so forth. This is not merely a way we can *talk* about argument; rather, it partially structures how we *understand* and *carry on* our reasoning. It is this metaphorical structuring of the epistemic domain that underlies the following force-dynamic interpretation of epistemic modals.

A′. *May.* As in the root case, where *may* denotes the absence of an external barrier, so in the epistemic case there is no barrier to block the forceful movement from the premises to the conclusion. As Sweetser says,

> The meaning of epistemic *may* would thus be that there is no barrier to the speaker's process of reasoning from the available premises to the conclusion expressed in the sentence qualified by *may*.[8]

Epistemic *may* may be read as, "There is no available evidence that constitutes a barrier to my moving to the conclusion specified."[9] As with the root sense of *may,* the relevant force schema is that for REMOVAL OF RESTRAINT. Thus, we get

(9) You *may* be right. (Read as, "I (We) am (are) not barred by the evidence from drawing that conclusion, based on your premises.")

Saying that someone *may* be correct does not imply that they are. It only claims that no facts or evidence at hand bar the movement to the conclusion. This is not to say that there might not be other evidence, of which we are not now aware, that would bar that very conclusion if it were known. Furthermore, the epistemic *may* frequently connotes that the reasoner, while not barred from drawing a certain conclusion, is still somewhat hesitant and does not feel forced to the conclusion.

B′. *Must*. *Must* denotes an irresistible force that drives me to a conclusion, as in

(10) He *must* be the Scarlet Pimpernel! (Read as, "The available evidence compels me to the conclusion that he is the Scarlet Pimpernel.")

The relevant force gestalt is that for COMPULSION, but here the force is rational rather than physical.

Sweetser notes an interesting asymmetry between the root and epistemic senses of *must*. In the root sense there is usually assumed to be some reluctance to performing the required action, so it is thought that a compelling force is necessary to overcome the resistance. For example, Tommy would rather not clean his room, so it takes the compelling force of parental authority to get him to perform the action. By contrast, in the epistemic domain it is generally assumed that there is *no* reluctance on the part of the person who is supposedly being forced to a conclusion. One may not like, or may be afraid of, the conclusion, but the resistance is not to the act of following out a chain of reasoning as such.

Sweetser has observed (in conversation) that there is a fairly straightforward explanation for this asymmetry. In the sociophysical realm (of root modals) we tend to assume that any restriction on our freedom is undesirable. The more freedom we have, the greater are our options for achieving our purposes. Therefore, we are typically reluctant to be forced, to have our freedom limited. The situation is different, on the other hand, in the epistemic realm. In our reasoning and deliberation, it is preferable that our conclusions be forced and limited. For if there is no limitation, if anything can follow from a set of premises or assumptions, then we could never get any definite knowledge. So it is in our interest to have the premises rationally force us to draw a certain definite conclusion.

C′. *Can*. In the epistemic domain we do not find the *positive "can"* (as in "That *can* be true"). A plausible explanation of this has been offered by George Lakoff (in conversation). Put simply, in the epistemic realm, if we *can* reason to some conclusion, then we *must* reason to it. If there really is sufficient rational force to move us to the conclusion, given the premises, then we are compelled to make the move. Once the barriers are removed, the force becomes irresistible, and we have *must* (i.e., "That *must* be true").

We do, however, find the negative *can* at the epistemic level. We find situations in which some proposition blocks the force along the path leading to the conclusion, as in

(11) She *can't* have gone over to the enemy. (Read as, "Some evidence or proposition [such as knowledge of her character] bars me from concluding that she is a traitor.")

The appropriate force gestalt is ENABLEMENT; but, again, in the epistemic realm it is understood metaphorically as involving rational forces or powers.

To conclude my treatment of the epistemic senses of modal verbs, I shall offer a few representative examples of some of the many additional modals analyzed in Sweetser's study (e.g., *will, shall, might, would, could, should, ought to, have to,* etc.). I offer readings for both the root and epistemic senses to suggest that there is a fairly clear, definite, and regular pattern of analysis possible, according to the hypothesis we have been pursuing.

i) *Ought to:*
(12a) She *ought to* make her bed. (Root.)
"Certain forces (family obligation) influence her toward the act of making her bed."
(12b) That *ought to* work. (Epistemic.)
"The available evidence influences me to conclude that that will work."

ii) *Have to:*
(13a) You *have to* do your homework before you watch television. (Root.)
"A force of (parental) authority compels you to do your homework."
(13b) She *has to* be Sarah's sister—Look at her mouth and eyes. (Epistemic.)
"The available evidence (especially her mouth and eyes) forces me to conclude that they are sisters."

iii) *Need to:*
(14a) He *needs to* throw a party every month. (Root.)
"Some internal conditions (his wanting to be liked, etc.) force him to throw parties regularly."
(14b) She *needn't be* a Communist; not every Pole is a Communist. (Epistemic.)
"The available evidence (her being Polish) doesn't force me to conclude that she is a Communist."

The previous analysis of these epistemic senses of modal verbs suggests an extremely important point about human meaning and reasoning. Note that in each case of an epistemic sense the analysis has the following general form:

"Some set of premises, or available evidence, forces me to conclude (or bars me from concluding) that X is the case."

We see that the modality here is not a property of propositions or connections among propositions in themselves; rather, the modality is a property of the reasoning processes of the *person* drawing, or refraining from drawing, some conclusion. Premises do not lead to conclusions in themselves, independent of reasoners—they lead to conclusions only insofar as their meaning is grasped, and their implications are seen, by a human being situated in the world. Reasoning is something people *do* with propositions, not some abstract relation among propositions.

Speech Act Structure

So far we have examined some root and epistemic modals whose senses are closely connected by means of underlying force-dynamic structures. We saw that in the domain of reasoning there are forces metaphorically related to the kinds and structures of forces operating in our sociophysical experience. The same force schemata appear in both root and epistemic senses, and these schemata are metaphorically elaborated to obtain the different (but related) meanings of the modal verb in question. It should not be surprising, then, to find similar force structures operating in the *structure of speech acts themselves*. After all, speech acts are *actions;* and, since our "physical" and "social" actions are subject to forces, we should expect that our "linguistic" actions are also subject to forces, metaphorically understood.

It might seem as though, in shifting from the *meaning* of modal verbs to the *structure of speech acts,* we jump from semantics to pragmatics and thus disrupt the unity of the previous analysis of force. This is not so, for two reasons. First, the rigid separation of semantics (meaning) from pragmatics (use) cannot be sustained, if we are to understand how meaning works.[10] In many cases, how we use a sentence partially determines its meaning. Second, even if an absolute semantics/pragmatics split is granted (which I do not admit), it would still be valuable to see how our notion of "force" in the realm of speech acts is tied to image-schematic structure metaphorically extended from our bodily experience of force. We could still seek possible connections among the manifestations of force in both the modals and in speech acts.

Ever since J. L. Austin taught us to think of utterances as actions we perform to produce certain effects, it has become standard practice to analyze meaningful utterances into meaningful contents that are presented with one or another standard illocutionary force.[11] In this spirit,

John Searle has argued at length that all speech acts can be represented by the following formula:[12]

(15) F(p)

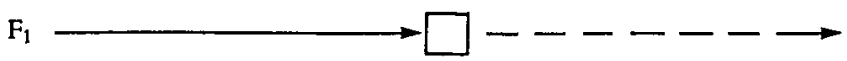
Here "p" represents the *propositional content* of the utterance, while "F" is the *illocutionary force* with which that content is presented. The utterance "Did John run away?" can be analyzed as a propositional content (*John ran away*) presented with the force of a *question*. We thus see that a single propositional content, such as *the meeting is over,* can be subject to a number of different forces to generate different kinds of speech acts:

(16) The meeting is over. (Force = making an assertion.)
(17) Is the meeting over? (Force = asking a question.)
(18) "The meeting is now over," said by the chairperson. (Force = causing it to be the case that the meeting is over, i.e., adjourning the meeting.)

Based on this model, Searle has constructed a taxonomy of speech act types that lays out the kinds of forces there are and the kinds of conditions that must obtain if the speech act is to be successfully performed.[13]

My only purpose in sketching this shell of speech-act theory is to highlight the fact that there are patterns of force at work in the structure of the speech act itself. So, besides physical force, social force, and epistemic force, there is a level of speech-act force (illocutionary force) dynamics. My central claim, once again, is that the relevant forces at this last level are also based on force gestalts metaphorically elaborated.

To discern these image-schematic structures in the speech act we need only recall that in most speech acts there will be a content presented *under* or *by means of* a given force. One of the relevant gestalts, then, will be that for COMPULSION. We can put some flesh on this skele-



COMPULSION

ton in the following way. As Michael Reddy has reminded us, there is a dominant metaphor that structures the bulk of both our understanding and talk about human communication.[14] He has named this the CONDUIT metaphor, which includes these parts:

1. Ideas or thoughts are objects.
2. Words and sentences are containers for these objects.
3. Communication consists in finding the right word-container for your idea-object, sending this filled container along a conduit or through space to the hearer, who must then take the idea-object out of the word-container.

The metaphor of the CONDUIT is one elaboration of the force gestalt sketched above. There are at least four different kinds of force (metaphorically interpreted) that can operate in a specific speech act situation:

i) First, there is the force that acts on the sentence-container with its idea-object to change the *form* of the expression. This force determines the shape of the utterance (i.e., of the speech-act container). If I am asking a question, then the utterance-container will typically be different from that which I use to make a statement or give a command. "John is home" has a different form or shape than "Is John home?" Thus, there is a force brought to bear by the speaker to adjust the form of their utterance so that it serves the communicative purposes of both speaker and hearer.

ii) Second, there is the force that acts on the hearer to determine how the hearer understands the utterance. This is the "illocutionary force," which determines whether the hearer takes the utterance as a question, assertion, command, or other type of illocutionary act. For example, statements are typically presented by speakers to force the hearers to add some belief to their belief system. Questions force the hearer to try to supply a certain relevant content to fill a gap in some informational structure. Directives exert a force to compel the hearer to realize some state of affairs. And performatives (Searle's "declaratives") constitute forceful changes of the state of the world.

iii) Third, the force with which the word- or utterance-container is sent through the conduit or through the space between speaker and hearer will have a certain magnitude. This means that there can be different "degrees of strength or force" in the making of a speech act. This is principally a matter of emphasis, as we see in (19) and (20).

(19) You might want to be a little careful around the lions.
(20) For God's sake, watch out for those lions!

Both of these are warnings, but the first is rather mild, while the second is obviously much stronger (it is made more forcefully). The difference lies in the force with which the sentence-container is thrust upon the hearer.

iv) Finally, there typically will be some effect(s) brought about as a

result of the illocutionary force of an utterance. Your commanding me to spit-shine my shoes might (in addition to my grasping the meaning of your utterance as a command) force me to shine my shoes, or it might cause me to laugh in your face, or to insult you. In speech-act theory these are known as "perlocutionary effects" of a speech act. They were understood by Austin as nonconventional causal effects on a hearer's actions or state as a consequence of the hearer grasping the illocutionary force of an utterance.

So far, I have discussed only the COMPULSION schema in any detail as it operates in the general structure of speech acts. Although I shall not pursue this point, there will be several other relevant force gestalts, besides that for COMPULSION, that make up various speech acts. In particular, one can think of the numerous ways in which certain illocutionary forces can be blocked, either by the content of the utterance itself or else by the context of the utterance.[15] In these cases we would want to analyze, at the very minimum, the role of the gestalts for BLOCKAGE, REMOVAL OF RESTRAINT, DIVERSION, and COUNTERFORCE.

To bring this discussion of force schemata in speech acts to a close, I would like to consider one representative example of phenomena of just this sort, that is, where we can discern tensions in the relations of forces *within the speech act itself.* Another way of stating this is to say that we are focusing on the relation of forces within the domain of the conversational interaction itself. Sweetser offers the following examples to illustrate the existence of forces and barriers in a *conversational* world, in addition to the sociophysical and epistemic worlds. Consider the following two *epistemic* senses of *may:*

(21) He may be a university professor, but I doubt it because he's so dumb.
(22) There may be a six-pack in the fridge, but I'm not sure because Joe had friends over last night.

In both of these cases we have epistemic *may,* to be understood as "I am not barred from concluding that . . ." But now contrast these with (23)–(24), as I have interpreted them:

(23) He may be a university professor, but he sure is dumb. ("I *admit* that he's a university professor, and I nonetheless *insist* that he's dumb.")
(24) There may be a six-pack in the fridge, but we have work to do. ("I *acknowledge* your offer of beer, and I nonetheless *refuse* it.")

As Sweetser points out, given the above readings, these are not cases of epistemic *may.* Her suggestion is that we are here dealing with a con-

versational world in which there are forces and barriers that constrain relationships of illocutionary forces. She reads (23) and (24) as follows:

(23′) I *do not bar* from our (joint) conversational world *the statement* that he is a university professor, but . . .

(24′) I *do not bar* from our conversational world *your offer* of beer, but . . .

In these two cases, we are not in the epistemic realm where forces push us from premises to conclusion; instead, we are in a conversational space where various speech acts (with their attendant forces) are being constrained or permitted by the speaker. Sweetser sums this up:

> In [these cases], then, *may* does not indicate the absence of a real (content)-world barrier, nor of an epistemic barrier, but rather the absence of a barrier in the *conversational* world. The interlocutor is being *allowed* by the speaker to treat a certain statement as appropriate or reasonable, or to present an offer.[16]

The phenomenon being highlighted here is the existence of a form of modal operator in the "conversational world" in which we perform various kinds of speech acts. In a sense, the speaker in (23)–(24) is saying, "I *will allow* your statement *to a certain extent,* but I will affirm another statement somewhat in tension with yours." We are dealing in this conversational world with *forces and barriers* metaphorically related to those that exist in the sociophysical and epistemic domains.

Force Gestalts: Unified Nonpropositional Structures

The central topic of this chapter is the nature and operation of experiential schemata that have gestalt structure. The previous chapter emphasized their nonpropositional dimension; the present chapter highlights their internal structure and explores the way that structure determines our network of meanings. I illustrated this structuring of meaning and understanding with examples drawn from one of the most important dimensions of human experience, that of forceful interaction. There are three main points I wish to stress on the basis of this representative case (i.e., of force gestalts as they influence the meaning of modal verbs).

First, I argued that image-schematic gestalts have considerable internal structure—they are not undifferentiated. On the contrary, it is the organization of their structure that makes them experientially basic meaningful patterns in our experience and understanding. The schemata for these gestalts have parts and dimensions that stand in various

relationships that allow us to make sense of our experience. For example, even in the simple COMPULSION schema there is significant structure: The actual force moves in some direction. If it interacts with some object, then it causes that object to move in the same direction. The relevant force vector traces out a path of motion. Thus, the moved object can be located at a given time relative to its progress along that projected path. And, in some cases, there is a goal toward which the force or forced object moves and in relation to which the object can be located. For such a minimal gestalt, this is actually quite a bit of structure.

What makes this an identifiable image-schematic gestalt is its repeatable pattern—a pattern that can therefore contribute to the regularity, coherence, and comprehensibility of our experience and understanding. To say that a gestalt is "experientially basic," then, is to say that it constitutes a recurring level of organized unity for an organism acting in its environment. Gestalts, in the sense I am using the term, are not unanalyzable givens or atomistic structures. They can be "analyzed" since they have parts and dimensions. But, any such attempted reduction will destroy the *unity* (the meaningful organization) that made the structure significant in the first place.

There is nothing "rock bottom" or "foundational" about image-schematic gestalt structures. What constitutes an experientially basic level will depend on background knowledge, motivations, interests, values, and previous experiences. Concerning interactions with physical objects, for instance, what is a basic gestalt for a layperson might differ considerably from that for a physicist, who brings a highly developed theory to bear in understanding the nature of the physical world as well as in interacting with it. Experiential basicness is a relative matter. Yet, because our bodies are very much alike with respect to their physiological makeup, we would expect to find commonly shared (if not universal) gestalt structures for many of our physical interactions within our environment.

Second, I argued that our vast network of meaning depends on the nature and relation of image-schematic gestalts. Sweetser's work served to give some elaboration to the claim that meaning involves image schemata. I did not focus, as I might have, on the more obvious fact that the meaning of our word "force" involves all of the schemata I diagrammed, plus others. Instead, I examined the much more subtle way in which the meanings of modal verbs arise from image schemata for FORCE. The projection of definite, and highly articulated, structure was always from the domain of the physical (as it is preconceptually

patterned) onto the social, epistemic, and speech-act realms. Such projections of structure from one experiential domain to another domain *of a different kind* are metaphorical processes. The nature of metaphorical projections is taken up in the next chapter. For now, the key point is that much of the structure we find in the social, epistemic, and conversational or speech-act domains is intimately related to parallel structure in our embodied (so-called physical) experience.

Third, I have suggested tentatively that there is an inferential structure in the epistemic domain that is tied to gestalt features of our experience of physical force and barriers. The meaning of *must* in the epistemic realm, as we saw, involves the COMPULSION schema, in which a force moves an object along a path. In the epistemic realm this movement *just is* an inferential pattern, for, if something *must* be true, then we are forced to infer that it *is*—no other conclusion will do.

Thus, we are brought back to where we started, with the more "logical" notion of modality as it bears on inference. Here, too, we can discern important inferential patterns based on FORCE schemata.

Inferential Patterns for Force Gestalts

At the end of the previous chapter I made a few suggestions as to the way in which certain inference patterns could be grounded experientially in schemata for containment. An exploration of nonpropositional schemata and their metaphorical extensions offers an alternative to the received view that "it just *is* the essence of rationality to have such an a priori formal structure." It might be that there are a priori structures of rationality, but we needn't simply assume this as an unquestionable foundation. To pursue my suggestion further, I want to consider a representative set of equivalences in modal logic that seem to be based on FORCE schemata.

The traditional branches of modal logic include the study of logical, moral, and epistemic necessity and possibility. As we have seen, Talmy and Sweetser have argued that such modal notions are understood in terms of forces as we experience them in our bodily perceptions and actions. Each of the realms of modal logical involves a corresponding kind of force: the force of logic, moral force, and the force of reason. Let us consider logical necessity, as understood in terms of the force of logic.

What stands behind our understanding of logical necessity is that the force of logic is overwhelming. As shown in Chapter 2, propositions are identified with locations. The force of logic moves us from