Chapter 2

Fictive Motion in Language and "Ception"

1 INTRODUCTION

This chapter proposes a unified account of the extensive cognitive representation of nonveridical phenomena—especially forms of motion—both as they are expressed linguistically and as they are perceived visually.[1] Thus, to give an immediate sense of the matter, the framework posited here will cover linguistic instances like the following sentences that depict motion with no physical occurrence: *This fence goes from the plateau to the valley; The cliff wall faces toward/away from the island; I looked out past the steeple; The vacuum cleaner is down around behind the clothes-hamper; The scenery rushed past us as we drove along.*

In a similar way, our framework will cover visual instances like the following in which one perceives motion with no physical occurrence: the "apparent motion" perceived, for example, in successive flashes along a row of lightbulbs, as on a marquee; the perceived "induced motion" of, say, a rod when only a surrounding frame is moved; the perception of a curved line as a straight line that has undergone processes like indentation and protrusion; the possible perception of an obliquely oriented rectangle (such as a picture frame) as having been tilted from a vertical-horizontal orientation; or the possible perception of a plus sign as involving the sequence of a vertical stroke followed by a horizontal stroke.

1.1 The Overall Framework

We begin with a fairly comprehensive overview of our proposed framework. Our unified account of the cognitive representation of nonveridical phenomena, just exemplified, is a particular manifestation of the "overlapping systems" model of cognitive organization. This model sees partial similarities and differences across distinct cognitive systems in the way

that they structure perceptual, conceptual, or other cognitive representations. As noted, we mainly consider similarities between two such cognitive systems: language and visual perception.

The particular manifestation of overlap that we address involves a major cognitive pattern: a discrepancy within the cognition of a single individual. Specifically, this discrepancy is between two different cognitive representations of the same entity, where one of the representations is assessed as being more veridical than the other. We presume that the two representations are the products of two different cognitive subsystems, and that the veridicality assessment itself is produced by a third cognitive subsystem whose general function is to generate such assessments.

In the notion of discrepancy that we intend here, the two cognitive representations consist of different contents that could not both concordantly hold for their represented object at the same time—that is, they would be inconsistent or contradictory, as judged by the individual's cognitive systems for general knowledge or reasoning. On the other hand, the individual need not have any active experience of conflict or clash between the two maintained representations, but might rather experience them as alternative perspectives. Further, in saying that the two discrepant representations differ in their assessed degree of veridicality, we use the less common term "veridical"—rather than, say, a term like "true"—to signal that the ascription is an assessment produced by a cognitive system, with no appeal to some notion of absolute or external reality.

Of the two discrepant representations of the same object, we will characterize the representation assessed to be more veridical as **factive** and the representation assessed to be less veridical as **fictive**. Adapted from its use in linguistics, the term "factive" is here again intended to indicate a cognitive assessment of greater veridicality, but not to suggest (as perhaps the word "factual" would) that a representation is in some sense objectively real. And the term "fictive" has been adopted for its reference to the imaginal capacity of cognition, not to suggest (as perhaps the word "fictitious" would) that a representation is somehow objectively unreal. As a whole, this cognitive pattern of veridically unequal discrepant representations of the same object will here be called the pattern of general **fictivity**.

In the general fictivity pattern, the two discrepant representations frequently—though not exclusively—disagree with respect to some single dimension, representing opposite poles of the dimension. Several different dimensions of this sort can be observed. One example of such a dimension

is "state of occurrence." Here, factive presence (the presence of some entity in the more veridical representation) is coupled with fictive absence (the absence of that entity from the less veridical representation) or vice versa. Another example of a dimension is "state of change." Here, the more veridical representation of an object could include factive stasis, while the less veridical representation includes fictive change—or vice versa. One form of this last dimension when applied to a physical complex in space-time is the more specific dimension "state of motion." Here, the more veridical representation could include stationariness where the less veridical representation has motion—or vice versa. Thus, frequently in conjunction with their factive opposites, we can expect to find cases of fictive presence, fictive absence, fictive stasis, fictive change, fictive stationariness, and fictive motion. In fact, to a large extent, general fictivity can accommodate any "fictive X."

Though treating all these types, the present study deals most with fictive motion, usually in combination with factive stationariness. It will be seen that such fictive motion occurs preponderantly more than does fictive stationariness coupled with factive motion. As will be discussed, this asymmetry reflects a general cognitive bias toward dynamism.

The general fictivity pattern can be found in a perhaps parallel fashion in both language and vision. In language, the pattern is extensively exhibited in the case where one of the discrepant representations is the belief held by the speaker or hearer about the real nature of the referent of a sentence, and the other representation is the literal reference of the linguistic forms that make up the sentence. Here, the literal representation is assessed as less veridical than the representation based on belief. Accordingly, the literal representation is fictive, while the representation based on belief is factive. Given our focus on the pattern in which fictive motion is coupled generally with factive stationariness, we here mainly treat the linguistic pattern in which the literal meaning of a sentence ascribes motion to a referent that one otherwise normally believes to be stationary. Thus, in one of the introductory examples, *This fence goes from the plateau to the valley,* we presume by our general beliefs that the fence is factively stationary, while the literal meaning of the sentence fictively presents the fence as moving.

In vision, one main form of the general fictivity pattern is the case where one of the discrepant representations is the concrete or fully palpable percept that one has of a scene on viewing it, and the other representation is a particular less palpable percept that one can concurrently

have of the same scene. Here, the less palpable percept is assessed as the less veridical of the two representations. In a way that is parallel with the linguistic case, the term "factive" may be applied to the more palpable visual representation, and the term "fictive" to the less palpable representation. We will say that an individual "sees" the factive representation but only "senses" the fictive representation (when it occurs at a particular lower level of palpability, to be discussed later). Here too, we focus on fictive motion, where the less palpable visual representation is of motion while the fully palpable representation is generally of stationariness. Thus, on viewing a certain line drawing, one may factively "see" at a high level of palpability a static "Pac Man" shape, and at the same time fictively "sense" at a low level of palpability the dynamic event of a circle having a wedge removed from it.

To accommodate this account of visual representations that differ with respect to their palpability, we posit the presence in cognition of a gradient parameter of palpability. Moreover, one may identify a number of additional cognitive parameters that largely tend to correlate with the palpability parameter. All of these "palpability-related parameters" are characterized in section 9.1. Further, these parameters appear to extend continuously through a cognitive domain larger than that generally associated with perception alone, one that in fact covers the combination of what is usually associated differentially with separate domains of perception and conception. Accordingly, to accommodate the full range of each such parameter, we advance the idea of a single continuous cognitive domain, that of "ception."

In the present chapter, we largely restrict our study of general fictivity in language to the case where both of the two discrepant representations are of a physical complex in space-time. In this way, there is generally the potential for any linguistic example to have an analog in a visual format. Accordingly, in a cross-domain correspondence of this sort, we could expect to find two component parallels. One parallel would hold between the two factive representations and the other between the two fictive representations. In particular, one parallel would hold between the linguistic representation of a sentence that is believed to be veridical and the concrete fully palpable appearance of the corresponding visual display. The other parallel would then hold between the less veridical literal reference of the sentence and a less palpable associated image perceived on viewing the display.

If we view this correspondence starting from the language end, a linguistic example of general fictivity whose representations pertain to physical entities in space-time can, in effect, be mapped onto a visual example of general fictivity. In such a mapping, the linguistic referential difference between credence and literality is then translated in the visual domain into a difference in palpability. Experimental methods would be needed to determine especially whether the parallel between the two fictive representations holds. In fact, one aim for the present study is to serve as a guide and as a call for such experimental research.

The restriction of the present study to the representation of physical forms in space-time excludes treatment of nonspatial metaphor. For example, a metaphor like *Her mood went from good to bad* would be excluded: although its source domain is motion in space-time, its target domain is the nonphysical one of mood states. However, as discussed later, linguistic metaphor as a whole fits as a category within the framework of general fictivity. General fictivity can serve as the superordinate framework because, among other reasons, its concepts and terms can apply as readily to visual representations as to linguistic ones, whereas metaphor theory is cast in concepts and terms more suitable for language alone. Using the perspective and methods of cognitive semantics, the present study of fictive motion is based in language, but extends out from there to considerations of visual perception.

1.2 Fictive Motion in Language

Fictive motion in language encompasses a number of relatively distinct categories. These categories include "emanation," "pattern paths," "frame-relative motion," "advent paths" (including "site manifestation" and "site arrival"), "access paths," and "coextension paths." This last category, perhaps the type of fictive motion most familiar in the previous linguistic literature, was termed "virtual motion" in Talmy 1983, "extension" in Jackendoff 1983, "abstract motion" in Langacker 1987, and "subjective motion" in Matsumoto 1996. Our current term "coextension paths" is used as part of the more comprehensive taxonomy of fictive motion presented here.

1.2.1 Introductory Illustration Illustrating this last category here can serve as an orientation to fictive motion in general. This category is most often illustrated by forms like *This road goes from Modesto to Fresno* or

The cord runs from the TV to the wall. But a purer demonstration of this type of fictive motion would exclude reference to an entity that supports the actual motion of other objects (as a road guides vehicles) or that itself may be associated with a history of actual motion (like a TV cord). The "mountain range" example in (1) avoids this problem.

(1) a. That mountain range lies (longitudinally) between Canada and Mexico.
b. That mountain range goes from Canada to Mexico.
c. That mountain range goes from Mexico to Canada.

Here, (1a) directly expresses the more veridical static spatial relationships in a stative form of expression, without evoking fictive motion. But (1b) and (1c) represent the static linear entity, the mountain range, in a way that evokes a sense or a conceptualization of something in motion—respectively, from north to south and from south to north. These latter two sentences manifest the general fictivity pattern. They each involve two discrepant representations of the same object, the mountain range. Of these two representations, the fictive representation—that is, the one that is assessed and experienced as less veridical—consists of the literal reference of the words, which directly depict the mountain range as moving. The factive representation, the one assessed and experienced as more veridical, consists of our belief that the mountain range is stationary. This factive representation is the only representation present in the sentence in (1a), which accordingly does not manifest the general fictivity pattern.

1.2.2 The Phenomenology of Fictive Motion Most observers can agree that languages systematically and extensively refer to stationary circumstances with forms and constructions whose basic reference is to motion. We can term this **constructional fictive motion**. Speakers exhibit differences, however, over the degree to which such expressions evoke an actual sense or conceptualization of motion—what can be called **experienced fictive motion**. Thus, for the same instance of constructional fictive motion, some speakers will report a strong semantic evocation of motion, while other speakers will report that there is none at all. What does appear common, though, is that every speaker experiences a sense of motion for *some* fictive-motion constructions.

Where an experience of motion does occur, there appears an additional range of differences as to what is conceptualized as moving. This conceptualization can vary across individuals and types of fictive motion. Even

the same individual may deal with the same example of fictive motion differently on different occasions. Included in the conceptualizations of this range, the fictive motion may be manifested by the named entity (e.g., by the mountain range in (1)); by some unnamed object that moves with respect to the named entity (e.g., a car or hiker relative to the mountain range); in the mental imagery of the speaker or hearer, by the imagistic or conceptual equivalent of their focus of attention moving relative to the named entity; by some abstracted conceptual essence of motion moving relative to the named entity; or by a sense of abstract directedness suggesting motion relative to the named entity. The strength and character of experienced fictive motion, as well as its clarity and homogeneity, are a phenomenological concomitant of the present study that will need more investigation.

1.2.3 Distinguishing Features The several distinct categories of fictive motion indicated above differ from each other with respect to a certain set of conceptual features. Each category of fictive motion exhibits a different combination of values for these features, of which the main ones are shown in (2).

(2) *Principal features distinguishing categories of fictive motion in language*
   a. Factive motion of some elements need not/must be present for the fictive effect.
   b. The fictively moving entity is itself factive/fictive.
   c. The fictive effect is observer neutral/observer based—and, if observer based:
      i. The observer is factive/fictive.
      ii. The observer moves/scans.
   d. What is conceived as fictively moving is an entity/the observation of an entity.

Out of the range of fictive-motion categories, this study selects for closest examination the category of emanation. The reason is that this category appears previously to have been largely unrecognized. The other indicated categories of fictive motion will be more briefly discussed in section 8.[2]

1.3 Properties of the Emanation Type as a Whole

Amid the range of fictive-motion categories, **emanation** is basically the fictive motion of something intangible emerging from a source. In most

subtypes, the intangible entity continues along its emanation path and terminates by impinging on some distal object. The particular values of the general fictive features of (2) that are exhibited by the emanation category are listed in (3). Specifically, the intangible entity is what moves fictively and is itself fictive, and its fictive motion does not depend on any factive motion by some tangible entity nor on any localized observer.

(3) *The feature values for emanation paths in language*
   a. Factive motion of some elements need not be present for the fictive effect.
   b. The fictively moving entity is itself fictive.
   c. The fictive effect is observer neutral.
   d. What is conceived as fictively moving is an entity.

The category of emanation comprises a number of relatively distinct types. We present four of these emanation types in section 2.5: "orientation paths," "radiation paths," "shadow paths," and "sensory paths." The illustrations throughout will be from English only in the present version of this study, but examples from other languages can be readily cited. The demonstrations of at least constructional fictive motion will rely on linguistic forms with basically real-motion referents such as verbs like *throw* and prepositions like *into* and *toward*. In the exposition, wherever some form of linguistic conceptualization is posited, we will raise the possibility of a corresponding perceptual configuration. Then, in section 7, we will specifically suggest perceptual analogs to the emanation types that have been discussed.

2 ORIENTATION PATHS

The first type of emanation that we consider is that of **orientation paths**. The linguistic conceptualization—and possibly a corresponding visual perception—of an orientation path is of a continuous linear intangible entity emerging from the front of some object and moving steadily away from it. This entity may be conceived or perceived as a moving intangible line or shaft—the only characterization used below. Alternatively, though, the entity might be conceived or perceived as some intangible abstraction moving along a stationary line or shaft—itself equally intangible—that is already in place and joined at one end to the front of the object. In addition to fictive motion along the axis of such a line, in some cases the line can also be conceptualized or perceived as moving laterally.

In this characterization, the "front" of an object is itself a linguistic conceptualization or perceptual ascription based on one of two factors: either a particular kind of asymmetry in the object's physical configuration, or the object's moving along a path, where the leading side would generally constitute the front.[3] In the main cases relevant here, such a front can be either a planar or "face"-type front, consisting of an approximately planar surface on a volumetric object, or a point-type front, consisting of an end point of a linearly shaped object.

Presented next are five subtypes of orientation paths that differ with respect to several factors, including whether the front is a face type or a point type, and whether the fictive motion of the intangible line is axial or lateral. First, though, we note the occurrence of constructions sensitive to the fictive *presence* of an intangible line aligned with the front of an object, before we proceed to its fictive motion. Consider the sentences in (4).

(4) a. She crossed in front of me/the TV.
    b. She crossed ??behind/*beside me/the TV.

The sentences here show that the verb *cross* can felicitously be used when walking transversely in front of an object with a front, but only poorly when walking behind, and not at all when walking to one side.[4] This usage pattern seems to point to the concept that there is something linear present to walk across directly in front of an object, but not elsewhere with respect to that object. We would argue that what is thus being crossed is the posited intangible line conceived to emerge from the front of an object, which will next be seen to exhibit fictive motion in a further set of construction types.

2.1 Prospect Paths

The first type of orientation path that we examine can be termed a **prospect path**. The orientation that an object with a face-type front has relative to its surroundings can be conceptualized linguistically—and perhaps perceived—in terms of fictive motion. With its front face, the object has a particular "prospect," "exposure," or "vista" relative to some other object in the surroundings. This prospect is characterized as if some intangible line or shaft emerges from the front and moves continuously away from the main object relative to the other object. The linguistic constructions, in effect, treat this line as a "Figure" moving relative to the other object as "Ground" or "Reference Object" (see chapters I-3 and I-5 for these

terms) along a path indicated by directional adpositions. In English, such constructions generally employ verbs like to *face* or to *look out*.

In the example in (5), the vertical side of a cliff acts as its face-type front. The cliff's prospect on its surroundings is characterized in terms of a fictive course of motion emerging from its face and moving along the path specified by the preposition relative to a valley as Reference Object. Again, this example manifests the general fictivity pattern. The literal sense of its words depicts a fictive, less veridical representation in which something moves from the cliff wall along a path oriented with respect to the valley. But this representation is discrepant with the factive, more veridical representation consisting of our belief that all the referent entities in the scene are static and involve no motion.

(5) The cliff wall faces toward/away from/into/past the valley.

2.2 Alignment Paths

The **alignment path** type of orientation path pertains to a stationary straight linear object with a point-type front. The orientation of such a linear object is here conceptualized linguistically—and perhaps perceived—in terms of something intangible moving along the axis of the object, emerging from its front end, and continuing straight along a prepositionally determined path relative to some distal object. As it happens, the English constructions that evoke this arrangement are not free to represent just any orientation, but are limited to the two cases where the linear object is aligned with the distal object—the front being the end either closer to or further from the distal object. The sentences in (6) illustrate this type.[5]

(6) The snake is lying toward/away from the light.

Here, the snake is the linear object with its head as the point-type front, and the light is the distal object. Of note, this construction combines a verb of stationariness, *lie*, with a path preposition, *toward* or *away from*, that coerces the verb's semantic properties. A sentence with *lie* alone would permit an interpretation of the snake as coiled and, say, pointing only its head at or away from a light. But in the normal understanding of (6), the snake's body forms an approximately straight line that is aligned with the light. That is, the addition of a path preposition in this construction has the effect of forcing a fictive "alignment path" interpretation that requires a straight-line contouring of the snake's body. The hypothesis that fictive orientation paths emerge from an object's front and move

away from the object correctly accounts for the fact that the sentence with *toward* refers to the head end of the snake as the end closer to the light, while the sentence with *away from* indicates that the head end is the further end.

2.3 Demonstrative Paths

The **demonstrative** type of orientation path again involves a linear object with a point-type front from which an intangible line emerges. But here the fictively moving line functions to direct or guide someone's attention along its path. The particular orientation of the linear object can either be an independent factor that simply occasions an instance of directing someone's attention, or can be intentionally set to serve the purpose of attentional guidance. This function of directing a person's attention can be the intended end result of a situation. Or it can be a precursor event that is instantiated or followed by another event, such as the person's directing his or her gaze, or moving bodily along the fictive path.

Thus, in the examples in (7), a linear object with a front end, such as an arrow or an extended index finger, seems to emit an intangible line from its front end. This line moves in the direction of the object's orientation so as to direct someone's attention, gaze, or physical motion along the path specified by the preposition.

(7) a. I/The arrow on the signpost pointed toward/away from/into/past the town.
b. I pointed/directed him toward/past/away from the lobby.

2.4 Targeting Paths

In a **targeting path**, an Agent intentionally sets the orientation of a front-bearing object so that the fictive line that is conceptualized or perceived as emerging from this front follows a desired path relative to the object's surroundings. This fictive motion establishes a path along which the Agent further intends that a particular subsequent motion will travel. This subsequent motion either is real or is itself fictive. Although comparatively complex, something like this sequence of intentions and actions, with a single or double fictive path, seems to underlie our concepts of 'aiming', 'sighting', or 'targeting'. Consider the sentences in (8) in this regard.

(8) I pointed/aimed (my gun/camera) into/past/away from the living room.

Here, the case of a bullet shot from the aimed gun exemplifies real motion following the preset fictive path. In contrast, the camera provides an instance of fictive motion following the fictive path, with a so-conceived photographic "probe" emerging from the camera's front.

One might ask why the camera example is included here under the targeting type of orientation path, rather than below under sensory paths along with "looking." The reason is that the act of looking is normally treated differently in English from the act of photographic shooting. We normally do not speak of "aiming" or "pointing" our gaze, and we do not conceive of the act of looking as involving first the establishment of a targeting path and then a viewing along that path.

2.5 Line of Sight

Line of sight is a concept that underlies a number of linguistic patterns and perhaps also is a component of perceptual structure. It is an intangible line emerging from the visual apparatus typically located on the front of an animate or mechanical entity. The present discussion deals only with *lateral* motion of the line of sight—that is, with shifts in its orientation. Axial fictive motion along the line of sight will be treated in the section on sensory paths. Additional evidence for treating the shifting line of sight as an orientation path is that the sentences exhibiting this phenomenon can use not just sensory verbs like *look* but also nonsensory verbs like *turn*.

In the examples in (9), the object with the vision-equipped front—whether my head with its eyes or the camera with its lens—swivels, thus causing the lateral motion of the line of sight that emerges from that front. The path preposition specifies the particular path that the line of sight follows. Consider how fictive motion is at work in the case of a sentence like *I slowly turned/looked toward the door*. A path preposition like *toward* normally refers to a Figure object's executing a path in the direction of the Reference Object, where the distance between the two objects progressively decreases. But what within the situation depicted by the example sentence could be exhibiting these characteristics? The only object that is physically moving is my turning head, yet that object stays in the same location relative to the door, not moving closer to it. Apparently what the preposition *toward* in this sentence refers to is the motion of the line of sight that emerges from my eyes. As I turn my head in the appropriate clockwise or counterclockwise direction, this line of

sight does indeed follow a path in the direction of the door and shorten its distance from it.

(9) I slowly turned/looked— // I slowly turned my camera—toward the door. / around the room. / away from the window. / from the painting, past the pillar, to the tapestry.

We can note that English allows each linguistic form in a succession of path indications to specify a different type of fictive motion. Thus, in (10), the first path-specifying form, the satellite *down*, indicates a lateral motion of a line of sight, of the type discussed in this section. Under its specification, the likely interpretation is that my line of sight is initially horizontal (I am looking "straight ahead"), and then swivels downward so as to align with the axis of a well. The second spatial form, the preposition *into*, indicates that once my line of sight is oriented at a downward angle, the fictive motion of my vision then proceeds away from me axially along the line of sight, thus entering the well.

(10) I quickly looked down into the well.

3 RADIATION PATHS

The second type of emanation we consider is that of **radiation paths**. The linguistic conceptualization of a radiation path is of radiation emanating continuously from an energy source and moving steadily away from it. This radiation can additionally be understood to comprise a linear shaft and to subsequently impinge on a second object. This additional particularization is the only type treated here. In this type, then, the radiating event can be characterized as involving three entities: the radiator, the radiation itself, and the irradiated object. This radiating event then involves three processes: the (generation and) emanation of radiation from the radiator, the motion of the radiation along a path, and the impingement of the radiation on the irradiated object. A radiation path differs from an orientation path in that the latter consists of the motion of a wholly imperceptible line. In a radiation path, though, one can often indeed detect the presence of the radiation—for example, in the case of light radiation, one can see the light. What one cannot directly detect—and, hence, what remains imperceptible—is any motion of this radiation.

The sentences in (11) reflect the preceding characterization of radiation for the particular case of light in the way that they are linguistically

constructed. This linguistic construction mainly involves the choices of subject, of path-specifying preposition, and of prepositional object. In both sentences, then, the general understanding is that the visible light is a radiation; that the sun is the source of the light (perhaps its generator, but at least its locus of origination); that the light emanates from the sun and moves steadily as a beam along a straight path through space; and that the light moves into the cave or impinges on its back wall to illuminate that spot.

(11) a. The sun is shining into the cave/onto the back wall of the cave.
b. The light is shining (from the sun) into the cave/onto the back wall of the cave.

Now, as compelling as this characterization of light radiation may be felt to be, it is, in the end, purely a conceptualization. Although physicists may tell us that photons in fact move from the sun to the irradiated object, we certainly cannot actually see any such occurrence. Therefore, any correspondence between the scientific characterization and the conceptualization of the phenomenon must be merely coincidental. In other words, the so-conceived motion of radiation from the radiator to the irradiated must be fictive motion. Since direct sight does not bring a report of light's motion, it must be other factors that lead to a conceptualization in terms of motion away from the sun, and we will speculate on those factors in section 6. At this point, however, the task is to suggest a number of viable alternatives to the normal conceptualization. These alternatives show that the unique appearance of this conceptualization cannot be explained by virtue of its being the only conceptualization possible.

One alternative conceptualization is that there is a radiation path but that it moves in the reverse direction from that in the prevailing conceptualization. Imagine the following state of affairs: All matter contains or generates energy. The sun (or a comparable entity) attracts this energy. The sun draws this energy toward itself when there is a straight clear path between itself and the matter. Matter glows when its energy leaves it. The sun glows when energy arrives at it. An account of this sort is in principle as viable as the usual account. In fact, it is necessarily so, because any phenomenon that could be explained in terms of imperceptible motion from A to B must also be amenable to an explanation in terms of a complementary imperceptible motion from B to A. However, for all its equality of applicability, the fact is that this reverse-direction scenario is

absent from—even resisted by—our normal conceptual apparatus. And it is certainly absent from extant linguistic constructions. Thus, English lacks any sentence like that in (12), and we suspect that any counterpart formulation is universally absent from the languages of the world.

(12) *The light is shining from my hand onto the sun.

The conceptualization that an object like the sun, a fire, or a flashlight produces light that radiates from it to another object is so intuitively compelling that it can be of value to demonstrate the viability of the reverse-direction conceptualization in different circumstances. Consider, for example, a vertical pole and its shadow on the ground. The sun-as-Source conceptualization here has the pole as blocking the light that would otherwise proceed from the sun onto the ground directly behind the pole. But the reverse-direction conceptualization works here as well. The sun attracts energy from the side of the pole facing it, but it cannot do so from the portion of the ground directly behind the pole because there is no straight clear path between that portion of the ground and the sun—the pole blocks the transit of energy in the reverse direction. Since no energy is drawn out of the portion of the ground behind the pole, it fails to glow, whereas the portions of ground adjacent to it, from which energy is being directly drawn, do glow.

Or consider a fire. Here, one can see that the surfaces of oneself facing the fire are brighter than the other surfaces and, in addition, one can feel that they are warmer as well. Further, this effect is stronger the closer one is to the fire. Once again, the fire-as-Source of both light and heat is not the only possible conceptualization. The same reverse-direction conceptualization used for the sun holds as well for the fire. The additions in this example are that when the fire attracts energy from the parts of one's body facing it, the departure of that energy causes not only a glow but also the sensation of warmth. (Such warmth is of course also the case for the sun, but more saliently associated with fire, hence saved for the present example.) And the one further factor here is that the attraction that the fire exerts on an object such as one's body is stronger the closer it is.

The reverse-direction conceptualization is not the only feasible alternative to the prevailing conceptualization of a radiation path. This prevailing conceptualization is composed of a constellation of factors, any one of which can be challenged. The reverse-direction alternative attempted to invert the directionality of the fictive motion in the prevailing conceptualization. But we can also test out the factor that holds that a radiation

path originates at one of the salient physical objects and terminates at the other. Thus, we can check the viability of a conceptualization in which light originates at a point between the two salient objects and fictively moves out in opposite directions to impinge on each of those two objects. The sentence in (13) tries to capture this conceptualization. However, this sentence does not work linguistically, and the conceptualization that it expresses seems wholly counterintuitive.

(13) *The light shone out onto the sun and my hand from a point between us.

Another factor in the normal conceptualization that we can try to challenge is the assumption that the radiation moves at all. Perhaps the radiation does not exhibit fictive motion at all but rather rests in space as a stationary beam. But sentences like that in (14) show that this conceptualization, too, has neither linguistic nor intuitive viability.

(14) *The light hung between the sun and my hand.

4 SHADOW PATHS

The third type of emanation can be termed a **shadow path**. This is the linguistic conceptualization—and perhaps also a perception—that the shadow of some object visible on some surface has fictively moved from that object to that surface. Sentences like those in (15) show that English suggests a conceptualization of this sort through its linguistic constructions. Thus, these sentences set up the nominal that refers to the shadow as the Figure, the object whose shadow it is as the Source, and the surface on which the shadow is located as the Ground object, here functioning as Goal. The sentences also set up the predicate as a motion verb like *throw*, *cast*, *project*, or *fall*, as well as a path preposition such as *into*, *onto*, *across*, or *against*.

(15) a. The tree threw its shadow down into/across the valley.
b. The pillar cast/projected a shadow onto/against the wall.
c. The pillar's shadow fell onto/against the wall.

We can note that with radiation paths, the argument could conceivably be made that the direction of the fictive motion proceeds, say, from the sun to my hand, because that is the direction that photons actually travel. But however tenable a weak argument like this may be, even this argument could not be used in the case of shadow paths. For there is no theory

of particle physics that posits the existence of "shadowons" that move from an object to the silhouette of its shadow.

5 SENSORY PATHS

One category of emanation paths well represented in language is that of **sensory paths**, including **visual paths**. This type of fictive motion involves the conceptualization of two entities, the **Experiencer** and the **Experienced**, and of something intangible moving in a straight path between the two entities in one direction or the other. By one branch of this conceptualization, the Experiencer emits a **Probe** that moves from the Experiencer to the Experienced and detects it upon encounter with it. This is the "Experiencer as Source" type of sensory path. By the other branch of the conceptualization, the Experienced emits a **Stimulus** that moves from the Experienced to the Experiencer and sensorily stimulates that entity on encountering it. This is the "Experienced as Source" type of sensory path. Sight, in particular, is thus either treated as a probing system that emanates from or is projected forth by a viewer so as to detect some object at a distance, or it is treated as a visual quality that emanates from some distal object and arrives at an individual, thereby stimulating a visual experience.

We can first illustrate this phenomenon using a nonagentive verb lexicalized so as to take the Experiencer as subject, namely *see*. Here, the two oppositely directed paths of fictive motion are represented by two different path phrases, as in (16).

(16) a. The enemy can see us from where they're positioned.
b. ?The enemy can see us from where we're standing.

Some speakers have difficulty with (16b)-type sentences with the Experiencer as Source, but this difficulty generally disappears for the counterpart passive sentence, as shown in (17b).

(17) a. We can be seen by the enemy from where they're positioned.
b. We can be seen by the enemy from where we're standing.

Further, generally no problem arises at all for nonvisual sensory paths—for example, those for audition or olfaction, as seen in (18).

(18) a. I can hear/smell him all the way from where I'm standing.
b. I can hear/smell him all the way from where he's standing.

The bidirectional conceptualizability of sensory paths can also be seen in alternatives of lexicalization. Thus, among the nonagentive vision verbs in English, *see* is lexicalized to take the Experiencer as subject and the Experienced as direct object, thereby promoting the interpretation of the Experiencer as Source. But *show* is lexicalized to take the Experienced as subject and can take the Experiencer as the object of the preposition *to*, thereby promoting the interpretation of the Experienced as Source. We illustrate in (19).

(19) a. Even a casual passerby can see the old wallpaper through the paint.
b. The old wallpaper shows through the paint even to a casual passerby.

Despite these forms of alternative directionality, fictive visual paths may generally favor the Experiencer as Source. This is the case for English, where some forms with the Experienced as Source offer difficulty to some speakers, and the use of a verb like *show* is minimal relative to that of a verb like *see*. Further, agentive verbs of vision in English are exclusively lexicalized for the Experiencer as subject and can take directional phrases only with the Experiencer as Source. As shown in (20a), this is the case with the verb *look*, which takes the Experiencer as subject and allows a range of directional prepositions. Here, the conceptualization appears to be that the Agent subject volitionally projects his line of sight as a Probe from himself as Source along the path specified by the preposition relative to a Reference Object.[6] However, there is no (20b)-type construction with *look* in which the visual path can be represented as if moving to the Experiencer as goal.

(20) a. I looked into/toward/past/away from the valley.
b. *I looked out of the valley (into my eyes).
〈where I am located outside the valley〉

6 A UNIFYING PRINCIPLE AND AN EXPLANATORY FACTOR FOR EMANATION TYPES

So far, this chapter has laid out the first-level linguistic phenomena that show different types of fictive emanation. It is now time to consider the principles that govern these phenomena and the context that generalizes them.

In the preceding part of the chapter, the conceptualizations associated with the different types of emanation were treated as distinct. But underlying such diversity, one may discern commonalities that unite the various types and may posit still deeper phenomena that can account for their existence. We present here a unifying principle and an explanatory factor.

6.1 The Principle That Determines the Source of Emanation

For the emanation types in which a fictive path extends between two objects, we can try to ascertain a cognitive principle that determines which of the two objects will be conceptualized as the Source of the emanation while the other object is understood as the goal. On examination, the following cognitive principle appears to be the main one in operation: The object that is taken to be the more active or determinative of the two is conceptualized as the Source of the emanation. This will be called the **active-determinative principle**.

We can proceed through the realizations of this principle as it has functioned in the different emanation types. Thus, in radiation paths, as between the sun and my hand, or the sun and the cave wall, the sun is perceived as the brighter of the two objects. This greater brightness appears to lead to the interpretation that the sun is the more active object, in particular, more energetic or powerful. By the operation of the active-determinative principle, the sun will be conceptualized, and perhaps perceived, as the source of the radiation moving through space into impingement with the other object, rather than any of the alternative feasible conceptualizations that were presented earlier. Thus, particular, this principle accounts for the absence of any linguistic formulations that depict the sun as drawing energy from objects.

Another application of the active-determinative principle can be seen in shadow paths. As between, say, a pole and the shadow of the pole, the pole is the more determinative entity, while the shadow is the more contingent or dependent entity. This is understood from such evidence as that in total darkness or in fully diffuse light, the pole is still there but no shadow is present. Further, one can move the pole and the shadow will move along with it, whereas no comparable operation can be performed on the shadow. By the operation of the active-determinative principle, the shadow-bearing object is thus conceptualized as generating the shadow, which then moves fictively from that object to an indicated surface. That is, it is by the operation of the principle that this interpretation of the

direction of the fictive motion prevails, rather than any alternative interpretation such as that the shadow itself, or something intangible, moves from the surface that it is on to the physical object.

A further realization of the active-determinative principle can be seen in the case of agentive sensory paths—ones with an Experiencer that acts as an intentional Agent as well as with an Experienced entity. Here, it seems, it is the very property of exercised agency that leads to the interpretation that the Agent is more active than the Experienced entity, which is either inanimate or is currently not manifesting relevant agency. By the operation of the active-determinative principle, then, the agentive Experiencer is conceptualized as the Source of the sensory path, whose fictive motion proceeds from the Experiencer to the Experienced. Thus, in the visual example presented earlier, *I looked into the valley*, since the referent of *I* is understood as an agentive Experiencer while the referent of *valley* is understood as a nonagentive Experienced entity, the active-determinative principle requires that the Experiencer be conceptualized as the Source of the fictive sensory motion, and this, in fact, is the only available interpretation for the sentence.

The active-determinative principle also holds for those types of orientation paths that are agentive, like targeting paths and agentive demonstrative paths. Here, the active and determinative entity in the situation is the Agent who fixes the orientation of the front-bearing object, such as a camera or the Agent's own arm with extended index finger. With our principle applying correctly again, it will be this object, positioned at the active-determinative locus, that will be conceptualized as the Source of the fictive emanation.

The fact that nonagentive sensory paths can be conceptualized as moving in either of two opposite directions might at first seem to challenge the principle that the more active or determinative entity is treated as the source of fictive emanation. But this need not be the case. It may be that either object can, by different criteria, be interpreted as more active than the other. For example, by one set of criteria, a nonagentively acting Experiencer, from whom a detectional probe is taken to emanate, is interpreted as more active than the entity probed. But under an alternative set of criteria, the Experienced entity that is taken to emit a stimulus is interpreted as being more active than the entity stimulated by it. Thus, the active-determinative principle is saved. The task remaining is to ascertain the additional cognitive criteria that ascribe greater activity to

one set of phenomena or to a competing set, and that are in effect in the absence of the principle's already known criteria (such as greater agency or energeticness).

Finally, there is a remainder of emanation types to which the active-determinative principle does not obviously apply in any direct way, namely, the nonagentive orientation path types: prospect paths, alignment paths, and nonagentive demonstrative paths. In these types, the fictive motion emanates from only one of the two relevant entities, but this entity is not apparently the more active or determinative of the two. In these cases, however, the directionality of the fictive motion may be set indirectly by the conceptual mapping of principle-determined cases onto the configuration, as described in the next section.

6.2 The Possible Basis of Fictive Emanation and Its Types

If it is correct that the more active or determinative entity is conceptualized as the Source of fictive emanation, the next question is why this should be the case. We speculate that the active-determinative principle is a consequence of a foundational cognitive system that every sentient individual has and experiences, that of "agency." Specifically, the individual's exercise of agency functions as the model for the Source of emanation. We remain agnostic on whether the connection is learned or innate. If it is learned in the course of development, then each individual's experience of agency leads by steps to the conceptualization of fictive emanation. If it is innate, then something like the same steps may have been traversed by genetically determined neural configurations as these evolved. Either way, we can suggest something of the steps and their consequent interrelationships.

The exercise of agency can be understood to have two components, the generation of an intention and the realization of that intention (see chapters I-4 and I-8). An intention can be understood as one's desire for the existence of some new state of affairs where one has the capability to act in a way that will bring about that state of affairs. The realization component, then, is one's carrying out of the actions that bring about the new state of affairs. Such exercise of agency is experienced as both active and determinative. It is active because it involves the generation of intentions and of actions, and it is determinative because it remodels conditions to accord with one's desires. In this way, one's experience of the characteristics of agency may provide one with the model for the active-determinative principle.

The particular form of agency that can best serve as such a model is that of an Agent's affecting a distal physical object—what can be called the **agent-distal object pattern**.[7] Here, an Agent that intends to affect the distal object must either move to it with her whole body, reach to it with a body part, or cause (as by throwing) some intermediary object to move to it. The model-relevant characteristics of this form of agency are that the determining event, the act of intention, takes place at the initial locus of the Agent, and the ensuing activity that finally affects the distal object progresses through space from that initial locus to the object. But these are also the characteristics of the active-determinative principle, namely, the more active or determinative entity is the Source from which fictive motion emanates through space until reaching the less active or determinative entity, the distal object. Hence, one can posit that the pattern of agency affecting a distal object is the model on which the active-determinative principle is based.

In particular, we can see how the agent-distal object pattern can serve as the model for the two main agentive forms of emanation—that is, for agentive demonstrative paths and agentive sensory paths. To consider the former case first, the specific agent-distal object pattern of extending the arm to reach for some object may directly act as the model for agentive demonstrative paths, such as an Agent extending his arm and pointing with his finger. In both cases, the extending arm typically exhibits actual motion away from the body along a line that connects with the target object, where, when fully extended, the arm's linear axis coincides with its path of motion. Possibly some role is played by the fact that the more acute tapered end of the arm, the fingers, leads during the extension and is furthest along the line to the object when the arm is fully extended. Such an agentive demonstrative path might in turn serve as the model for the nonagentive type—for example, that associated with a figure like an arrow, whose linear axis also coincides with the line between the arrow and the distal object, and whose tapered end is the end closest to the distal object and is the end conceptualized as the Source from which the demonstrative line emanates.

Similarly, we can see parallels between the agent-distal object pattern, in which the Agent executes factive motion toward the distal object, and agentive visual sensory paths, in which the Experiencer projects a fictive line of sight from himself to the distal object. Specifically: Like the Agent, the Experiencer is active and determinative. Like the Agent, the Experiencer has a front. Like the Agent's moving along a straight line between

his front and the distal object, the intangible line of sight moves in a straight line between the front of the Experiencer and the distal object. Like this line's moving away from the initial locus of the Agent, the visual sensory path moves away from the Experiencer as Source. And like the Agent's motion continuing along this line until it reaches the object, the visual sensory path progresses until encounter with the distal object. Thus, the perception of the Agent's motion in the physical world appears to be mapped onto the conceptualization of an intangible entity moving along a line. Again, such a mapping might either be the result of learning during an individual's development, or might have been evolutionarily incorporated into the perceptual and conceptual apparatus of the brain. Either way, an organism's production of factive motion can become the basis for the conceptualization of fictive motion.

In turn, this agentive visual type of fictive emanation may serve as the model for several nonagentive emanation types. In particular, this modeling may occur by the conceptual mapping or superimposition of a schematized image—that of an Experiencer's front emitting a line of sight that proceeds forward into contact with a distal object—onto situations amenable to a division into comparably related components. Thus, in the prospect type of orientation path, the Experiencer component may be superimposed onto, say, a cliff, with her face corresponding to the cliff wall, with her visual path mapped onto the conceptualized schematic component of a prospect line moving away from the wall, and with the distal object mapped onto the vista toward which the prospect line progresses.[8]

In a similar way, the schema for the agentive visual path may get mapped onto the radiation situation. Here, the Experiencer, as the active determinative Agent, is associated with the most energetic component of the radiation scene—the brightest component in the case of light, say, the sun. The visual path is mapped onto the radiation itself, for example, onto light visible in the air (especially, say, a light beam, as through an aperture in a wall), and the distal object is mapped onto the less bright object in the scene. The direction of motion conceptualized for the visual path is also mapped onto the radiation, which is thus conceptualized as moving from the brighter object to the duller object. An association of this sort can explain why much folk iconography depicts the sun or moon as having a face that looks outward.

As for shadow paths, the model may be the situation in which the agentive Experiencer herself stands and views her own shadow from

where she is located. Once again, the visual path moving from this Experiencer to the ground location of the shadow is mapped onto the conceptualization of the fictive path that the shadow itself traverses from the solid body onto the ground. A reinforcement for this mapping is that the Experiencer is determinative as the Agent, and the solid object is determinative over the shadow dependent on it.

The only emanation types not yet discussed in terms of mapping are the nonagentive sensory paths that can proceed in either direction. The direction going from the Experiencer to the Experienced is clear, since that is the same as for agentive viewing. We may account for the reverse case—where the Experienced emits a Stimulus—on the grounds that it, too, can serve as a receptive frame onto which to superimpose the model of an Agent emitting a visual path. What is required is simply the conclusion that the conceptualization of an object emitting a Stimulus can be taken as active enough to be treated as a kind of modest agency in its own right, and hence to justify this conceptual imposition of an Agent onto it.

7 THE RELATION OF EMANATION IN LANGUAGE TO COUNTERPARTS IN OTHER COGNITIVE SYSTEMS

In this section, we present a number of apparent similarities in structure or content between the emanation category of fictive motion in language and counterparts of emanation in cognitive systems other than that of language. We mainly consider similarities that language has to perception and to cultural conceptual structure, as well as to folk iconography, which may be regarded as a concrete symbolic expression of perceptual structure. A brief description of our model of cognitive organization, referred to in the introduction, will first provide the context for this comparison.

7.1 The "Overlapping Systems" Model of Cognitive Organization

Converging lines of evidence in the author's and others' research point to the following picture of human cognitive organization. Human cognition comprehends a certain number of relatively distinguishable cognitive systems of fairly extensive compass. This research has considered similarities and dissimilarities of structure—in particular of conceptual structure—between language and each of these other major cognitive systems: visual perception, kinesthetic perception, reasoning, attention, memory, planning, and cultural structure. The general finding is that each cognitive system has some structural properties that may be uniquely its own, some

further structural properties that it shares with only one or a few other cognitive systems, and some fundamental structural properties that it has in common with all the cognitive systems. We assume that each such cognitive system is more integrated and interpenetrated with connections from other cognitive systems than is envisaged by the strict modularity notion (see Fodor 1983). We term this view the **overlapping systems** model of cognitive organization (the introduction to this volume provides further details).

7.2 Fictive Emanation and Perception

The visual arrays that might yield perceptual parallels to the emanation type of fictive motion have been relatively less investigated by psychological methods than in the case of other categories of fictive motion (see below). One perceptual phenomenon related to orientation paths has been demonstrated by Palmer (1980) and Palmer and Bucher (1981). They have found that in certain arrays consisting of co-oriented equilateral triangles, subjects perceive all the triangles at once pointing by turns in the direction of one or another of their common vertices. Moving the array in the direction of one of the common vertices biases the perception of the pointing to be in the direction of that vertex. However, these experiments did not test for the perception of an intangible line emerging from the vertex that is currently experienced as the pointing "front" of each triangle or of the array of triangles. One might need experiments, for example, that test for any difference in a subject's perception of a further figure depending on whether or not a fictive line was perceived to emerge from the array of triangles and pass through that figure. But confirmation of a perceptual analog to emanation paths must await such research.

We can also note that Freyd's (e.g., 1987) work on "representational momentum" does not demonstrate perception of orientation paths. This work involved the sequential presentation of a figure in successively more forward locations. The subjects did exhibit a bias toward perceiving the last-presented figure further ahead than its actual location. But this effect is presumably due to the factively forward progression of the figure. To check for the perceptual counterpart of linguistic orientation paths, experiments of this type would need to test subjects on the presentation of only a single picture containing a forward-facing figure with an intrinsic front.

The robust and extensive representation of fictive emanation in language calls for psychological research to test for parallels to this category

of fictive motion in perception. That is, the question remains whether the appropriate experimental arrangements will show for this category particular perceptions that accord with the general fictivity pattern, hence, with the concurrent perception of two discrepant representations, one of them more palpable and veridical than the other. Consider, for example, visual arrays that include various front-bearing objects, designed to test the perception of fictive orientation paths in their various types—prospect paths, alignment paths, demonstrative paths, and targeting paths. One would need to determine whether subjects, on viewing these arrays, see the factive stationariness of the depicted objects at the fully palpable level of perception but concurrently sense the fictive motion of something intangible emanating from the objects' fronts at a faintly palpable level of perception.

Similarly, to probe for visual counterparts of linguistic radiation paths, research will need to test for anything like a fictive and less palpable perception of motion along a light beam, in a direction away from the brighter object—a perception concurrent with, perhaps superimposed on, the factive and more palpable perception of the beam as static. Comparably, to test for a visual parallel to linguistic shadow paths, experimental procedures will need to probe whether subjects, on viewing a scene that contains an object and its shadow, have some fictive, less palpable sense of the shadow as having moved from that object to the surface on which it appears, concurrently with a factive and palpable perception of everything within the scene as stationary. Finally, to check for a perceptual analog of visual sensory paths in language, one can use either a scene that depicts someone looking or a subject's own process of looking at entities to determine whether the subjects simply perceive a static array of entities, or additionally superimpose on that a less palpable perception of motion along the probing line of sight. In fact, a series of experiments (e.g., Winer and Cottrell 1996)—while not directly probing a subject's perception of the process of another person's employing his vision—does probe a subject's beliefs in this regard. This study has shown that a large percentage of subjects, ranging from schoolchildren to college students, preferentially hold a notion of extramission—the notion that sight involves something emerging from the eyes—over a notion of intromission. The subjects display this extramission preference both in their responses to questions and, even more so, to computer graphic displays that present something moving in either direction between a depicted viewer and viewed object.

7.3 Fictive Emanation and Folk Iconography

Fictive representations that are normally only sensed at a lower level of palpability can sometimes be modeled by fully palpable representations. An example to be cited later is the use of stick-figure drawings or of pipe-cleaner sculptures to explicitly image objects' schematic structure, which is normally only sensed. In the same way, various aspects of fictive emanation that are also normally only sensed have been made explicit in the concrete depictions of folk iconography.

For example, fictive sensory paths of the agentive visual type are linguistically conceptualized as an intangible line that an Agent projects forward from his eyes through space into contact with a distal object. But this is exactly the character of Superman's "X-ray vision" as depicted in comic books. Superman sends forth from his eyes a beam of X-rays that penetrates opaque materials to make contact with an otherwise obscured object and permits it to be seen. Note that Superman's X-ray vision is not depicted as stimuli that emanate from the obscured object and proceed toward and into Superman's eyes where they might be perceptually registered. Such an Experienced-to-Experiencer path direction might have been expected in that our understanding of X-ray equipment is that the radiation moves from the equipment onto a photographic plate on which the image is registered. This plate might have been analogized to Superman's eyes. However, the conceptual model in which the Agent emits a sensory Probe appears to hold sway in the cartoon imagery.

There is a comparable example based on the fact that the linguistic conceptualization of an Agent emitting a visual Probe is represented not only by grammatical constructions and other closed-class forms, but also in metaphoric expressions. Thus, the expression "to look daggers at," as in *Jane looked daggers at John*, represents the notion that Jane's mien, reflecting a current feeling of hate for John, is elaborated as the projection of weapons from her eyes to John. Cartoon depictions in fact show a line of daggers going from the Experiencer's eyes to the body of the Experienced.

The linguistic conceptualization of fictive demonstrative paths emerging from the point-type front of a linear object, as from a pointing finger, seems also to parallel a type of iconographic depiction. This is the depiction of magical power beams that an Agent can project from his extended fingertips. For example, movies and comic books often have two battling sorcerers raise their extended hands and direct destructive beams at each other.

Finally, it is the author's observation—though a careful study would be needed—that in the process of a child's or adult's schematic drawing of the sun, after a circle for the body of the sun is completed, lines that represent its radiation are drawn radially outward from the circle, not inward toward it. If so, this iconographic procedure reflects the linguistic conceptualization of fictive radiation paths as emanating and moving off from the brightest object. Further, iconographic representations of the sun and moon often depict a face on the object, as if to represent the object as containing or comprising an Agent emitting the radiation of light. As noted in section 6.2, a representation of this sort can be attributed to the mapping of the schema of an agentive visual sensory path onto the radiation situation, much as it may be mapped onto other fictive-motion types.

7.4 The Relation of Fictive Emanation of Ghost Physics and Other Anthropological Phenomena

We can discern a striking similarity between fictive motion—in particular, orientation paths—and the properties ghosts or spirits exhibit in the belief systems of many traditional cultures. The anthropologist Pascal Boyer (1994) sees these properties as a culturally pervasive and coherent conceptual system that he calls "ghost physics." Boyer holds that ghost and spirit phenomena obey all the usual causal expectations for physical or social entities, with only a few exceptions that function as "attention attractors." Certain of these exceptions are widespread across many cultures. Mainly, such exceptions are invisibility or the ability to pass through walls or other solid objects. But other kinds of potential exceptions, ones that on other grounds might have equally seemed to be candidates for conceptualization as special properties, instead appear never to occur. An example of this is temporally backward causality. That is, cultural belief systems seem universally to lack a concept that a ghost can at one point in time bring about some state of affairs at a prior point in time.

Boyer has no explanation for the selection of particular exceptions that occur in ghost physics and may even find them arbitrary. However, we can suggest that the pattern of standard and exceptional properties is structured and cognitively principled. In fact, the findings reported in this chapter may supply the missing account. The exceptional phenomena found to occur in ghost physics may be the same as certain cognitive phenomena that already exist in other cognitive systems and that then are tapped for service in cultural spirit ascriptions. The linguistic expression

of fictive demonstrative paths and its gestural counterpart may well provide the relevant properties.

To consider gesture first, if I, for example, am inside a windowless building and am asked to point toward the next town, I will not, through gesticulations, indicate a path that begins at my finger, leads through the open doorway and out the exit of the building, and finally turns around and moves in the direction of the town. On the contrary, I will simply extend my arm with pointed finger in the direction of the town, regardless of the structure around me. That is, the demonstrative path, effectively conceptualized as an intangible line emerging from the finger, itself has the following crucial properties: (1) It is invisible, and (2) it passes through walls. These are the very same properties that are ascribed to spirits and ghosts.

These properties hold for the conceptualization that accompanies the linguistic expression of fictive demonstrative paths. For example, in the set of sentences *this arrow points to|toward|past|away from the town*, the use of any of the directional prepositions suggests the conceptualization of an intangible line emerging from the front end of the arrow, following a straight course coaxial with the arrow's shaft, and moving along the path represented by the preposition. Once again, this imaginal line is invisible and would be understood to pass through any material objects present on its path.

In addition to such demonstrative paths, we can observe further relations between cultural conceptualizations and another type of fictive emanation, that of agentive visual paths. First, consider the notion of the "evil eye," found in the conceptual systems of many cultures. In a frequent conception of the evil eye, an agent who bears malevolent feelings toward another person is able to transmit the harmful properties of these feelings along the line of her gaze at the other person. This is the same schema as for a fictive visual path: the Agent as Source projecting forth something intangible along her line of sight to encounter with a distal object. Second, a specific instance is found in the traditional tale of the Clackamas Chinook (Jacobs 1958) about the great-grandson of the Sun. This youth's spirit power is that of fire. And, in particular, the boy sets on fire any object toward which he directs his gaze. Again, the conceptualization here is apparently that the Agent's personal power moves from himself along his line of sight for execution when it reaches the terminus at a distal object.

Relations between fictive motion and cultural conceptualizations extend still further. One may look to such broadly encountered cultural concepts

as those of mana, power, fields of life force, or magical influence emanating from entities. Such forms of imagined energy—just like the fictive emanations of linguistic construals—are conceptualized (and perceived?) as being invisible and intangible, as being (generated and) emitted by some entity, as propagating in one or more directions away from that entity, and in some forms as then contacting a second distal entity that it may affect. The structural parallel between such anthropological concepts of emanation and the emanation type of fictive motion that we have here described for language is evident and speaks to a deeper cognitive connection.

It thus seems that the general fictivity complex generates the imaginal schemas of fictive motion not only in the cognitive systems of language and of visual perception, but also in that of cultural cognition, specifically in its conceptualizations of spirit and power. That is, in the cognitive culture system, the structure of such conceptions as ghost phenomena, harmful influence, and magical energy appears not to be arbitrary. Nor does it exhibit its own mode of construal or constitute its own domain of conceptual constructs of the sort posited, for example, by Keil (1989) and Carey (1985) for other categories of cognitive phenomena. Rather, it is probably the same or a parallel instance of conceptual organization already extant in other cognitive systems. In terms of the ''overlapping systems'' framework outlined earlier, general fictivity of this sort is thus one area of overlap across at least the three cognitive systems of language, visual perception, and cultural cognition.

8 FURTHER CATEGORIES OF FICTIVE MOTION

As indicated earlier, language exhibits a number of categories of fictive motion beyond the emanation type treated so far. We briefly sketch five further categories here.[9] For each, we suggest some parallels in visual perception that have already been or might be examined. The purpose of this section is to enlarge both the linguistic scope and the scope of potential language-perception parallelism. In the illustrations that follow, the fictive-motion sentences are provided, as a foil for comparison, with factive-motion counterpart sentences, shown within brackets.

8.1 Pattern Paths

The **pattern-paths** category of fictive motion in language involves the fictive conceptualization of some configuration as moving through space.

In this type, the literal sense of a sentence depicts the motion of some arrangement of physical substance along a particular path, while we factively believe that this substance is either stationary or moves in some other way than along the depicted path. For the fictive effect to occur, the physical entities must factively exhibit some form of motion, qualitative change, or appearance/disappearance, but these in themselves do not constitute the fictive motion. Rather, it is the pattern in which the physical entities are arranged that exhibits the fictive motion. Consider the example in (21).

(21) *Pattern paths*
As I painted the ceiling, (a line of) paint spots slowly progressed across the floor.
[cf. As I painted the ceiling, (a line of) ants slowly progressed across the floor.]

Here, each drop of paint does factively move, but that motion is vertically downward in falling to the floor. The fictive motion, rather, is horizontally along the floor and involves the linear pattern of paint spots already located on the floor at any given time. For this fictive effect, one must in effect conceptualize an envelope located around the set of paint spots or a line located through them. The spots thus enclosed within the envelope or positioned along the line can then be cognized as constituting a unitary Gestalt linear pattern. Then, the appearance of a new paint spot on the floor in front of one end of the linear pattern can be conceptualized as if that end of the envelope or line extended forward so as now to include the new spot. This, then, is the forward fictive motion of the configuration. By contrast, if the sentence were to be interpreted literally—that is, if the literal reference of the sentence were to be treated as factive—one would have to believe that the spots of paint physically slid forward along the floor.

In one respect, the pattern-paths type of fictive motion is quite similar to the emanation type. In both these categories of fictive motion, an entity that is itself fictive—in other words, is an imaginal construct—moves fictively through space. One difference, though, is that the emanation type does not involve the factive motion of any elements within the referent scene. Accordingly, it must depend on a principle—the active-determinative principle—to fix the source and direction of the fictive motion. But the pattern-paths type does require the factive motion or change of some components of the referent situation for the fictive effect

to occur. This is what determines the direction of the fictive motion, so no additional principle need come into play.

The perceptual phenomena generally termed "apparent motion" in psychology would seem to include the visual counterpart of the pattern-paths type of fictive motion in language. But to establish the parallel correctly, one may need to subdivide apparent motion into different types. Such types are perhaps mostly based on the speed of the process viewed and, one may speculate, involve different perceptual mechanisms. Much research on apparent motion has employed a format like that of dots in two locations appearing and disappearing in quick alternation. Here, within certain parameters, subjects perceive a single dot moving back and forth between the two locations. In this fast form of apparent motion, the perceptual representation most palpable to subjects is in fact that of motion, so it would not correspond to the linguistic case.

On the other hand, a slower type of apparent motion may exist that can be perceived and that now would parallel the linguistic case. One example might consist of a subject viewing a row of lightbulbs in which one bulb after another briefly turns on at consciously perceivable intervals. Here, it may be surmised, a subject will have an experience that fits the general fictivity pattern. The subject will perceive at a higher level of palpability —that is, as factive—the stationary state of the bulbs, as well as the periodic flashing of a bulb at different locations. But the subject will concurrently perceive at a lower level of palpability—and assess it as being at a lower level of veridicality—the fictive motion of a seemingly single light progressing along the row of bulbs.

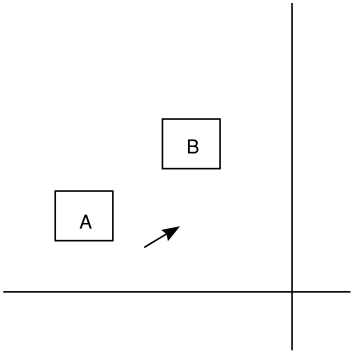
8.2 Frame-Relative Motion

With respect to a global frame of reference, a language can factively refer to an observer as moving relative to her stationary surroundings. This condition is illustrated for English in (22a). But a language can alternatively refer to this situation by adopting a local frame around the observer as center. Within this frame, the observer can be represented as stationary and her surroundings as moving relative to her from her perspective. This condition is illustrated in (22b). It is thus a form of fictive motion, one in which the factively stationary surroundings are fictively depicted as moving. In a complementary fashion, this condition also contains a form of fictive stationariness, for the factively moving observer is now fictively depicted as stationary. Stressing the depiction of motion, the general type of fictive motion at work here is termed **frame-relative**

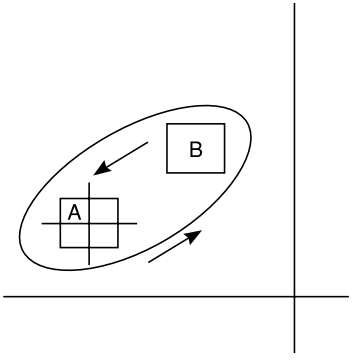
motion. We term the specific fictive effect here the **observer-based** type of frame-relative motion.

Further, a language can permit shifts between a global and a local framing of a situation within a single sentence. For instance, the example in (22c) shifts from the global frame to the local frame and, accordingly, shifts from a directly factive representation of the spatial conditions to a fictive representation. But one condition that no language seems able to represent is the adoption of a part-global and part-local conceptualization that is, accordingly, part factive and part fictive. Thus, English is constrained against sentences like (22d), which suggests the adoption of a perspective point midway between the observer and her surroundings.[10]

(22) *Frame-relative motion: with factively moving observer*



a. *Global frame: fictive motion absent*
I rode along in the car and looked at the scenery we were passing through.



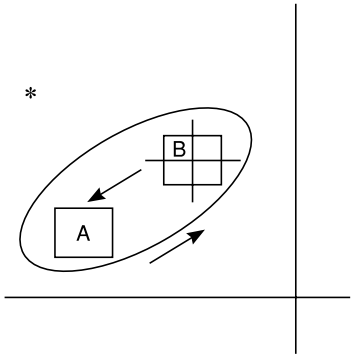
b. *Local frame: fictive motion present*
I sat in the car and watched the scenery rush past me.
[cf. I sat in the movie-set car and watched the backdrop scenery rush past me.]

c. *Shift in mid-reference from global to local frame, and from factive to fictive motion*
I was walking through the woods and this branch that was sticking out hit me.
[cf. I was walking through the woods and this falling pinecone hit me.]

d. *Lacking: part global–part local frame with part factive–part fictive motion*
*We and the scenery rushed past each other.
[cf. We and the logging truck rushed past each other.]

In the preceding examples, the observer was factively in motion while the observed (e.g., the scenery) was factively stationary—properties expressed explicitly in the global framing. In a complementary fashion, a sentence can also express a global framing in which, factively, the observer is stationary while the observed moves. This situation is illustrated in (23a). However, this complementary situation differs from the earlier situation in that it cannot undergo a local reframing around the stationary observer as center. If such a local frame were possible, one could find acceptable sentences that fictively depict the observer as moving and the observed as stationary. But sentences attempting this depiction—like (23bi) with a uniform local framing and (23bii) with a shift from global to local framing—are unacceptable. The unacceptable fictive local framing that they attempt is diagrammed in (23).

(23) *Frame-relative motion: with factively stationary observer*
a. *Global frame: fictive motion absent*
i. The stream flows past my house.
ii. As I sat in the stream, its water rushed past me.
b. *Local frame: blocked attempt at fictive motion*
i. *My house advances alongside the stream.
ii. *As I sat in the stream, I rushed through its water.



We can suggest an account for the difference between moving and stationary observers in their acceptance of fictive local framing. The main idea is that stationariness is basic for an observer. Accordingly, if an observer is factively moving, a sentence is free to represent the situation as such, but a sentence may also "ratchet down" its representation of the situation to the basic condition in which the observer is stationary. However, if the observer is already stationary—that is, already in his basic state—a sentence may only represent the situation as such and is not free to ratchet up its representation of the situation into a nonbasic state.

If this explanation holds, the next question is why stationariness should be basic for an observer. We can suggest a developmental account. An infant experiences the translational type of optic flow as a result of being carried along by a parent long before the stage at which it itself locomotes—that is, the stage at which it will agentively bring about optic flow itself. Thus, before the infant has had a chance to integrate its experience of moving into its perception of optic flow, it has months of experience of optic flow without an experience of moving. This earlier experience may be processed in terms of the surrounding world as moving relative to the self fixed at center. This experience may be the more foundational one and persist to show up in subtle effects of linguistic representations like those just seen.

One possible corroboration of this account can be cited. Infants at the outset do have one form of agentive control over their position relative to their surroundings, namely, turning the eyes or head through an arc. This action brings about not the forward type of optic flow just discussed, but a transverse type (though not one of extended rotation). Since the infant can thus integrate the experience of motor control in with experience of transverse optic flow at a foundational level, we should not expect to find

a linguistic effect that treats observer stationariness as basic relative to an observer's arc-sized turning motion. Indeed, English, for one language, typically permits only factive representations of such turning by an observer, as in *As I quickly turned my head, I looked over all the room's decorations*. It does not typically ratchet down to a fictive stationary state for the observer, as in **As I quickly turned my head, the room's decorations sped by in front of me*. A sentence of the latter sort would be used only for special effect, not in the everyday colloquial way in which the forward-motion cases are treated.

On the other hand, as still further corroboration, since extended spinning is not within the infant's early volitional repertoire but comes under agentive control only later, it should behave like forward translational motion and permit a linguistic reframing. Indeed, this is readily found, as in English sentences like *As our space shuttle turned, we watched the heavens spin around us*, or *I rode on the carousel and watched the world go round.*[11]

Psychological experiments have afforded several probable perceptual parallels to frame-relative motion in language. One parallel is the "induced motion" of the "rod-and-frame" genre of experiments. Here, prototypically, while a rectangular shape that surrounds a linear shape is factively moved, some subjects fictively perceive this frame as stationary while the rod moves in a complementary manner. However, this genre of experiments is not observer based in our sense, since the observer herself is not one of the objects potentially involved in motion. Closer to our linguistic case is the "motion aftereffect,"—for example, present where a subject has been spun around and then stopped. Here, the subject factively knows that she is stationary but concurrently experiences a perception—one that is assessed as less veridical, hence fictive—of the surroundings as turning about her in the complementary direction. Perhaps the experimental situation closest to our linguistic type would in fact be a subject's moving forward through surroundings, much as when riding in a train. The question is whether such a subject will concurrently perceive a factive representation of herself as moving through stationary surroundings, and a fictive representation of herself as stationary with the surroundings as moving toward and past her.

8.3 ADVENT PATHS

An **advent path** is a depiction of a stationary object's location in terms of its arrival or manifestation at the site it occupies. The stationary state of

the object is factive, whereas its depicted motion or materialization is fictive and, in fact, often wholly implausible. The two main subtypes of advent paths are "site arrival," involving the fictive motion of the object to its site, and "site manifestation," which is not fictive motion but fictive change, namely the fictive manifestation of the object at its site. This category is illustrated in (24).

(24) *Advent paths*
  A. *Site arrival*
    1. *With active verb form*
      a. The palm trees clustered together around the oasis.
      [cf. The children quickly clustered together around the ice cream truck.]
      b. The beam leans/tilts away from the wall.
      [cf. The loose beam gradually leaned/tilted away from the wall.]
    2. *With passive verb form*
      c. Termite mounds are scattered/strewn/spread/distributed all over the plain.
      [cf. Gopher traps were scattered/strewn/spread/distributed all over the plain by a trapper.]
  B. *Site manifestation*
      d. This rock formation occurs/recurs/appears/reappears/shows up near volcanoes.
      [cf. Ball lightning occurs/recurs/appears/reappears/shows up near volcanoes.]

For a closer look at one site-arrival example, (24a) uses the basically motion-specifying verb *to cluster* for a literal but fictive representation of the palm trees as having moved from some more dispersed locations to their extant neighboring locations around the oasis. But the concurrent factive representation of this scene is contained in our belief that the trees have always been stationarily located in the sites they occupy. Comparably, the site-manifestation example in (24d) literally represents the location of the rock formation at the sites it occupies as the result of an event of materialization or manifestation. This fictive representation is concurrent with our believed factive representation of the rock formation as having stably occupied its sites for a very long time.

We can cite two psychologists who have made separate proposals for an analysis of visual forms that parallels the linguistic site-arrival type of

fictive motion. Pentland (1986) describes the perception of an articulated object in terms of a process in which a basic portion of the object, such as, its central mass, has the remaining portions moved into attachment with it. An example is the perception of a clay human figure as a torso to which the limbs and head have been affixed. Comparably, Leyton (1992) describes our perception of an arbitrary curved surface as a deformed version of a simple surface. For example, a smooth closed surface is described as the deformation of a sphere, one that has undergone forces that he terms protrusion, indentation, squashing, and resistance. He shows that this set of processes corresponds to the psychologically salient causal descriptions that people give of shapes—for example, of a bent pipe or a dented door. In a similar way, as described in the tradition of Gestalt psychology, certain forms are regularly perceived not as original patterns in their own right, but rather as the result of some process of deformation applied to an unseen basic form. An example is the perception of a Pac Man–shaped figure as a circle with a wedge-shaped piece removed from it.

To consider this last example in terms of our general fictivity framework, a subject looking at such a Pac Man shape may experience two discrepant perceptual representations at the same time. The factive representation, held to be the more veridical and perceived as more palpable, will be that of the static Pac Man configuration per se. The fictive representation, felt as being less veridical and perceived as less palpable, will consist of an imagined sequence that starts with a circle, proceeds to the demarcation of a wedge shape within the circle, and ends with that wedge exiting or being removed from the circle.

8.4 Access Paths

An **access path** is a depiction of a stationary object's location in terms of a path that some other entity might follow to the point of encounter with the object. What is factive here is the representation of the object as stationary, without any entity traversing the depicted path. What is fictive is the representation of some entity traversing the depicted path, whether this is plausible or implausible. Though it is not specified, the fictively moving entity can often be imagined as being a person, some body part of a person, or the focus of one's attention, depending on the particular sentence, as can be seen in the examples of (25).

(25) *Access paths*

a. The bakery is across the street from the bank.
[cf. The ball rolled across the street from the bank.]

b. The vacuum cleaner is down around behind the clotheshamper.
[cf. I extended my arm down around behind the clotheshamper.]

c. The cloud is 1,000 feet up from the ground.
[cf. The balloon rose 1,000 feet up from the ground.]

In greater detail, (25a) characterizes the location of the bakery in terms of a fictive path that begins at the bank, proceeds across the street, and terminates at the bakery. This path could be followed physically by a person walking, or perceptually by someone shifting the focus of his gaze, or solely conceptually by someone shifting her attention over her mental map of the vicinity. The depicted path can be reasonable for physical execution, as when I use (25a) to direct you to the bakery when we are inside the bank. But the same depicted path may also be an improbable one. This would be the case when I use (25a) to direct you to the bakery when we are on its side of the street. It is unlikely that you will first cross the street, advance to the bank, and then recross to find the bakery. Rather, you will likely just proceed directly forward to the bakery. Further, a depicted access path can also be physically implausible or impossible. Such is the case for referents like that in *That quasar is 10 million light-years past the North Star*. Apart from the use of fictive access paths such as these, an object's location can generally also be directly characterized in a factive representation—for example, that in *The bakery and the bank are opposite each other on the street*.

Does the fictivity pattern involving access paths occur perceptually? We can suggest a kind of experimental design that might test for the phenomenon. Subjects can be shown a pattern containing some point to be focused on, where the whole can be perceived factively as a static geometric Gestalt and/or fictively as involving paths leading to the focal point. Perhaps an example would be a "plus"-shaped figure with the letter A at the top point and, at the left-hand point, a B to be focused on. A subject might factively and at a high level of palpability perceive a static representation of this figure much as just described, with the B simply located on the left. But concurrently, the subject might fictively and at a lower level of palpability perceive the B as located at the end point of a path that starts at the A and, say, either slants directly toward the B, or moves first down and then left along the lines making up the plus.

8.5 Coextension Paths

A **coextension path** is a depiction of the form, orientation, or location of a spatially extended object in terms of a path over the object's extent. What is factive here is the representation of the object as stationary and the absence of any entity traversing the depicted path. What is fictive is the representation of some entity moving along or over the configuration of the object. Though it is not specified, the fictively moving entity can often be imagined as being an observer, or the focus of one's attention, or the object itself, depending on the particular sentence, as can be seen in the examples of (26). Note that in (26a) the fictive path is linear, in (26b) it is radially outward over a two-dimensional plane, and in (26c) it is the lateral motion of a line (a north-south line advancing eastward), which is further correlated with a second fictive change (increasing redness).

(26) *Coextension paths*

a. The fence goes/zigzags/descends from the plateau to the valley.
   [cf. I went/zigzagged/descended from the plateau to the valley.]
b. The field spreads out in all directions from the granary.
   [cf. The oil spread out in all directions from where it spilled.]
c. The soil reddens toward the east.
   [cf. (i) The soil gradually reddened at this spot due to oxidation.
   (ii) The weather front advanced toward the east.]

Consider the fictivity pattern for (26a). On the one hand, we have a factive representation of the fence as a stationary object with linear extent and with a particular contour, orientation, and location in geographic space. Concurrently, though, we have the fictive representation evoked by the literal sense of the sentence, in which an observer, or our focus of attention, or perhaps some image of the fence itself advancing along its own axis, moves from one end of the fence atop the plateau, along its length, to the other end of the fence in the valley.

We can ask as before whether the general fictivity pattern involving coextension paths has a perceptual analog. The phenomenon might be found in a visual configuration that is perceived factively at a higher level of palpability as a static geometric form and, concurrently, perceived fictively at a lower level of palpability in terms of pathways along its delineations. For example, perhaps a subject viewing a "plus" configuration will see it explicitly as just such a "plus" shape, while implicitly sensing

something intangible sweeping first downward along the vertical bar of the plus and then rightward along the horizontal bar (see Babcock and Freyd 1988).

9 "CEPTION": GENERALIZING OVER PERCEPTION AND CONCEPTION

In this section, we suggest a general framework that can accommodate the visual representations involved in general fictivity, together with representations that appear in language.

Much psychological discussion has implicitly or explicitly treated what it has termed "perception" as a unitary category of cognitive phenomena. If further distinctions have been adduced, they have been the separate designation of part of perception as "sensation," or the contrasting of the whole category of perception with that of "conception/cognition." Part of the motivation for challenging the traditional categorization is that psychologists do not agree on where to draw a boundary through observable psychological phenomena such that the phenomena on one side of the boundary will be considered "perceptual" while those on the other side will be excluded from that designation. For example, as I view a particular figure before me, is my identification of it as a knife to be understood as part of my perceptual processing of the visual stimuli, or instead part of some other, perhaps later, cognitive processing? And if such identification is considered part of perception, what about my thought of potential danger that occurs on viewing the object? Moreover, psychologists not only disagree on where to locate a distinctional boundary, but also on whether there even is a principled basis on which one can adduce the existence of such a boundary.

Accordingly, it seems advisable to establish a theoretical framework that does not imply discrete categories and clearly located boundaries, and that recognizes a cognitive domain encompassing traditional notions of both perception and conception. Such a framework would then further allow for the positing of certain cognitive parameters that extend continuously through the larger domain (as described later). To this end, we adopt the notion of **ception** here to cover all the cognitive phenomena, conscious and unconscious, understood by the conjunction of perception and conception. While perhaps best limited to the phenomena of current processing, ception would include the processing of sensory stimulation, mental imagery, and currently experienced thought and affect. An indi-

vidual currently manifesting such processing with respect to some entity can now be said to "ceive" that entity.[12]

The main advantage of the ception framework in conjoining the domains of perception and conception is not that it eliminates the difficulty of categorizing certain problematic cognitive phenomena. Though helpful, that characteristic, taken by itself, could also be seen as throwing the baby out with the bathwater, in that it by fiat discards a potentially useful distinction simply because it is troublesome. The strength of the ception framework, rather, is precisely that it allows for the positing or recognition of distinctional parameters that extend through the whole of the new domain, parameters whose unity might not be readily spotted across a gerrymandered category boundary. Further, such parameters are largely gradient in character, and so can reintroduce the basis of the discrete perception-conception distinction in a graduated form. After all, the trouble with the perception-conception distinction is not that there is no motivation for it, but that it has been treated as a disjunct dichotomy.

We propose 13 parameters of cognitive functioning that appear to extend through the whole domain of ception and to pertain to general fictivity. Most of these parameters seem to have an at least approximately gradient character—perhaps ranging from a fully smooth to a merely rough gradience—with their highest value at the most clearly perceptual end of the ception domain and with their lowest value at the most clearly conceptual end of the domain. It seems that these parameters tend to covary or correlate with each other from their high to their low ends. That is, any particular cognitive representation will tend to merit placement at a comparable distance along the gradients of the respective parameters. Some of the parameters seem more to have discrete regions or categorial distinctions along their lengths than to involve continuous gradience, but these, too, seem amenable to alignment with the other parameters. One of the 13 parameters, the one that we term "palpability," appears to be the most centrally involved with vision-related general fictivity. Given that the other 12 parameters largely correlate with this one, we term the whole set that of the "palpability-related parameters."

This entire proposal of palpability-related parameters is heuristic and programmatic. It will require adjustments and experimental confirmation with regard to several issues. One issue is whether the set of proposed parameters is exhaustive with respect to palpability and general fictivity (presumably not), and, conversely, whether the proposed parameters are

all wholly appropriate to those phenomena. Another issue is the partitioning of general visual fictivity that results in the particular cognitive parameters named. Thus, perhaps some of the parameters presented later should be merged or split. More generally, we would first need to show that our proposed parameters are in synchrony—aligned from high end to low end—sufficiently to justify their being classed together as components of a common phenomenon. Conversely, though, we would need to show that the listed parameters are sufficiently independent from each other to justify their being identified separately, instead of being treated as aspects of a single complex parameter.

9.1 Palpability and Related Parameters

The parameter of palpability is a gradient parameter that pertains to the degree of palpability with which some entity is experienced in consciousness, from the fully concrete to the fully abstract. To serve as reference points, four levels can be designated along this gradient: the **(fully) concrete** level, the **semiconcrete** level, the **semiabstract** level, and the **(fully) abstract** level. These levels of palpability are discussed in the next four sections and illustrated with examples that cluster near them. In this section, we present the 13 proposed palpability-related parameters. As they are discussed here, these palpability-related parameters are treated strictly with respect to their phenomenological characteristics. There is no assumption that levels along these parameters correspond to other cognitive phenomena such as earlier or later stages of processing.

1. The parameter of **palpability** is a gradient at the high end of which an entity is experienced as being concrete, manifest, explicit, tangible, and palpable. At the low end, an entity is experienced as being abstract, unmanifest, implicit, intangible, and impalpable.

2. The parameter of **clarity** is a gradient at the high end of which an entity is experienced as being clear, distinct, and definite. At the low end, an entity is experienced as being vague, indistinct, indefinite, or murky.

3. The parameter of **intensity** is a gradient in the upper region of which an entity is experienced as being intense or vivid.[13] At the low end, an entity is experienced as being faint or dull.

4. The **ostension** of an entity is our term for the overt substantive attributes that the entity has relative to any particular sensory modality. In the visual modality, the ostension of an entity includes its "appearance" and motion—thus, more specifically, including its form, coloration, texturing, and pattern of movements. In the auditory modality, ostension

amounts to an entity's overt sound qualities, and in the taste modality, its flavors. As a gradient, the parameter of ostension comprises the degree to which an entity is experienced as having such overt substantive attributes.

5. The parameter of **objectivity** is a gradient at the high end of which an entity is experienced as being real, as having autonomous physical existence, and as having its own intrinsic characteristics. Such an entity is further experienced as being "out there"—that is, as external to oneself, specifically, to one's mind if not also one's body. At the low end of the gradient, the entity is experienced as being subjective, a cognitive construct, a product of one's own mental activity.[14]

6. The gradient parameter of **localizability** is the degree to which one experiences an entity as having a specific location relative to oneself and to comparable surrounding entities within some spatial reference frame. At the high end of the gradient, one's experience is that the entity does have a location, and that this location occupies only a delimited portion of the whole spatial field, can be determined, and is in fact known. At midrange levels of the gradient, one may experience the entity as having a location but as being unable to determine it. At the low end of the gradient, one can have the experience that the concept of location does not even apply to the ceived entity.

7. The gradient parameter of **identifiability** is the degree to which one has the experience of recognizing the categorial or individual identity of an entity. At the high end of the gradient, one's experience is that one recognizes the ceived entity, that one can assign it to a familiar category or equate it with a familiar unique individual, and that it thus has a known identity. Progressing down the gradient, the components of this experience diminish until they are all absent at the low end.

8. The **content/structure** parameter pertains to whether an entity is assessed for its content as against its structure. At the content end of this parameter—which correlates with the high end of other parameters—the assessments pertain to the substantive makeup of an entity. At the structure end of the parameter—which correlates with the low end of other parameters—the assessments pertain to the schematic delineations of an entity. While the content end deals with the "bulk" form of an entity, the structural end reduces or "boils down" and regularizes this form to its abstracted or idealized lineaments. A form can be a simplex entity composed of parts or a complex entity containing smaller entities. Either way, when such a form is considered overall in its entirety, the content end can provide the comprehensive summary or Gestalt of the form's character.

On the other hand, the structure end can reveal the global framework, pattern, or network of connections that binds the components of the form together and permits their integration into a unity.

9. The **type-of-geometry** parameter involves the geometric characterization imputed to an entity, together with the degree of its precision and absoluteness. At the high end of this parameter, the assessments pertain to the content of an entity and are (amenable to being) geometrically Euclidean, metrically quantitative, precise as to magnitude, form, movements, and so on, and absolute. At the low end of the parameter, the assessments pertain to the structure of an entity, and are (limited to being) geometrically topological or topology-like, qualitative or approximative, schematic, and relational or relativistic.

10. Along the gradient parameter of **accessibility to consciousness**, an entity is accessible to consciousness everywhere but at the lowest end. At the high end of the parameter, the entity is in the center of consciousness or in the foreground of attention. At a lower level, the entity is in the periphery of consciousness or in the background of attention. Still lower, the entity is currently not in consciousness or attention, but could readily become so. At the lowest end, the entity is regularly inaccessible to consciousness.

11. The parameter of **certainty** is a gradient at the high end of which one has the experience of certainty about the occurrence and attributes of an entity. At the low end, one experiences uncertainty about the entity—or, more actively, one experiences doubt about it.

12. What we will dub the parameter of **actionability** is a gradient at the high end of which one feels able to direct oneself agentively with respect to an entity—for example, to inspect or manipulate the entity. At the low end, one feels capable only of receptive experience of the entity.

13. The gradient parameter of **stimulus dependence** is the degree to which a particular kind of experience of an entity requires current online sensory stimulation in order to occur. At the high end, stimuli must be present for the experience to occur. In the midrange of the gradient, the experience can be evoked in conjunction with the impingement of stimuli, but it can also occur in their absence. At the low end, the experience does not require, or has no relation to, sensory stimulation for its occurrence.

The terms for all the preceding parameters were intentionally selected so as to be neutral to sense modality. But the manner in which the various modalities behave with respect to the parameters—in possibly different ways—remains an issue. We briefly address this issue later. But for

simplicity, the first three levels of palpability presented next are discussed only for the visual modality. Our characterization of each level of palpability will generally indicate its standing with respect to each of the 13 parameters.

9.2 The Concrete Level of Palpability

At the concrete level of palpability, an entity that one looks at is experienced as fully manifest and palpable, as clear and vivid, with the ostensive characteristics of precise form, texture, coloration, and movement, and with a precise location relative to oneself and to its surroundings, where this precision largely involves a Euclidean-type geometry and is amenable to metric quantification. The entity is usually recognizable for its particular identity and is regarded as an instance of substantive content. The entity is experienced as having real, physical, autonomous existence—hence, not as dependent on one's own cognizing of it. It is accordingly experienced as being "out there"—that is, not as a construct in one's mind. The viewer can experience the entity with full consciousness and attention, has a sense of certainty about the existence and the attributes of the entity, and feels he can volitionally direct his gaze over the entity, change his position relative to it, or perhaps manipulate it to expose further attributes to inspection. Outside of abnormal psychological states (such as the experiencing of vivid hallucinations), this concrete experience of an entity requires currently online sensory stimulation—for example, in the visual case, one must be actually looking at the entity. In short, one experiences the entity at the high end of all 13 palpability-related parameters.

Examples of entities experienced at the concrete level of palpability include most of the manifest contents of our everyday visual world, such as an apple or a street scene. With respect to general fictivity, a representation ceived at the concrete level of palpability is generally experienced as factive and veridical. It can function as the background foil against which a discrepant representation at a lower level of palpability is compared.

9.3 The Semiconcrete Level of Palpability

We can perhaps best begin this section by illustrating entities ceived at the semiconcrete level of palpability, before outlining their general characteristics. A first example of a semiconcrete entity is the grayish region one "sees" at each intersection (except the one in direct focus) of a Hermann grid. This grid consists of evenly spaced vertical and horizontal white

strips against a black background and is itself seen at the fully concrete level of palpability. As one shifts one's focus from one intersection to another, a spot appears at the old locus and disappears from the new one. Another example of a semiconcrete entity is an after image. For example, after staring at a colored figure, one ceives a pale image of the figure in the complementary color when looking at a white field. Comparably, after a bright light has been flashed on one spot of the retina, one ceives a medium-grayish spot—an "artificial scotoma"—at the corresponding point of whatever scene one now looks at. An apparently further semiconcrete entity is the phosphene effect—a shifting pattern of light that spans the visual field—which results, for example, from pressure on the eyeball.

In general, an entity ceived at the semiconcrete level of palpability, by comparison with the fully concrete level, is experienced as less tangible and explicit, as less clear, and as less intense or vivid. It has the quality of seeming somewhat indefinite in its ostensive characteristics, perhaps hazy, translucent, or ghostlike. Although one has the experience of directly "seeing" the entity, its less concrete properties may largely lead one to experience the entity as having no real physical existence or, at least, to experience doubt about any such corporeality. Of the semiconcrete examples cited above, the grayish spots of the Hermann grid may be largely experienced as "out there," though perhaps not to the fullest degree because of their appearance and disappearance as one shifts one's focus. The "out there" status is still lower or more dubious for afterimages, artificial scotomas, and phosphenes, since these entities move along with one's eye movements. The Hermann grid spots are fully localizable with respect to the concretely ceived grid and, in fact, are themselves ceived only in relation to that grid. But an afterimage, artificial scotoma, or phosphene image ranks lower on the localizability parameter because, although each is fixed with respect to one's visual field, it moves about freely relative to the concretely ceived external environment in pace with one's eye movements. The identifiability of a semiconcrete entity is partially preserved in some afterimage cases, but the entity is otherwise largely not amenable to categorization as to identity.

Generally, one may be fully conscious of and direct one's central attention to such semiconcrete entities as Hermann grid spots, afterimages, scotomas, and phosphenes, but one experiences less than the fullest certainty about one's ception of them, and one can only exercise a still lower degree of actionability over them, being able to manipulate them only by

moving one's eyes about. The ception of Hermann grid spots requires concurrent online sensory stimulation in the form of viewing the grid. But, once initiated, the other cited semiconcrete entities can be ceived for a while without further stimulation, even with one's eyes closed.

With respect to general fictivity, a representation ceived at the semiconcrete level of palpability on viewing a scene is generally experienced as relatively more fictive and less veridical than the concrete-level representation usually being ceived at the same time. The type of discrepancy present between two such concurrent representations of a single scene is generally not that of fictive motion against factive stationariness, as mainly treated so far. Rather, it is one of fictive presence as against factive absence. That is, the fictive representation—for example, of Hermann-grid spots, of an afterimage, of an artificial scotoma, or of phosphenes—is assessed as being present only in a relatively fictive manner, while the factive representation of the scene being viewed is taken more veridically as lacking any such entities.

9.4 The Semiabstract Level of Palpability

An entity at the semiabstract level of palpability is experienced as present in association with other entities that are seen at the fully concrete level, but it itself is intangible and nonmanifest, as well as vague or indefinite and relatively faint. It has little or no ostension, and with no quality of direct visibility. In viewing a scene, one's experience is that one does not "see" such an entity explicitly but rather "senses" its implicit presence. In fact, we will adopt **sensing** as a technical term to refer to the ception of an entity at the semiabstract level of palpability while engaging in online viewing of something concrete.[15] One experiences an entity of this sort as "out there," perhaps localizable as a genuinely present characteristic of the concrete entities viewed, but not as having autonomous physical existence. Insofar as such a sensed entity is accorded an identity, it would be with respect to some approximate or vague category.

A sensed entity is of relatively low salience in consciousness or attention, seems less certain, and is difficult to act on. Often a sensed entity of the present sort is understood as a structural or relational characteristic of the concrete entities viewed. Its type of geometry is regularly topology-like and approximative. Such sensed structures or relationships can often be captured for experiencing at the fully concrete level by schematic representations, such as line drawings or wire sculptures, but they lack this degree of explicitness in their original condition of ception.

Since the semiabstract level of palpability is perhaps the least familiar level, we present a number of types and illustrations of it. We can here characterize the pattern of general fictivity that holds for several of the types presented below. General fictivity works in approximately the same way for four of the types: object structure, path structure, reference frames, and force dynamics. To characterize the general fictivity pattern for these four types together, we refer to them here collectively as "structurality." The representation of structurality that one senses in an object or an array is generally experienced as more fictive and less veridical than the factive representation of the concrete entities whose structurality it is. The representation of structurality is a case of fictive presence rather than of fictive motion. This fictive presence contrasts with the factive absence of such structurality from the concrete representation. Unlike most forms of general fictivity, the representation of concrete content and that of sensed structurality may seem so minimally discrepant with each other that they are rather experienced as complementary or additive. (The type in section 9.4.4 involving structural history and future has its own fictivity pattern, which will be described separately.) Much of visually sensed structure is similar to the structure represented by linguistic closed-class forms, and this parallelism will be discussed in section 11.

9.4.1 The Sensing of Object Structure One main type of sensed entity is the structure that we sense to be present in a single object or over an array of objects due to its arrangement in space. We term this the **sensing of object structure**. To illustrate first for the single-object case, consider an object of the geometric type that can be exemplified, say, by a vase or by a dumpster. When one views an object of this type, one sees at the concrete level of palpability certain particulars of ostension, such as outline, delineation, color, texture, and shading. But in addition, at the semiabstract level of palpability, one may sense in the object a certain structural pattern, one that consists of an outer envelope and a hollow interior.

More precisely, an object of this type is sensed—in terms of an idealized schematization—as consisting of a plane curved in a way that defines a volume of space by forming a boundary around it. A structural schema of this sort is generally sensed in the object in a form that is abstracted away from each of a number of other spatial factors. Thus, this "envelope/interior" structural schema can be sensed equally across objects that differ in magnitude, like a thimble and a volcano; that differ in shape, like a well and a trench; that differ in completeness of closure, like a beachball

and a punchbowl; or that differ in degree of continuity/discontinuity, like a bell jar and a birdcage. This pattern of ception shows—as is appropriate to the semiabstract level of palpability—that the type of geometry (parameter 9) that is here sensed in the structure of an object is topological or topology-like. In particular—as just seen from the set of geometric factors that are disregarded—object structure sensed as being of the envelope-interior type is magnitude neutral and shape neutral, as well as being closure neutral and discontinuity neutral.

For a more complex example, on viewing a person, one sees at the fully concrete level of palpability that person's outline and form, coloration and shading, textures, the delineations of the garments, and so on. However, one does not see but rather senses the person's bodily structure in its current configuration—for example, when in a squatting or leaning posture. A sensed structural schema of this sort can be made concretely visible, as when a stick-figure drawing or a pipe-cleaner sculpture is shaped to correspond to such a posture. But one does not concretely see such a schema when looking at the person—one only senses its presence. The Marrian abstractions (Marr 1982) that represent a human figure in terms of an arrangement of axes of elongation is one theoretization of this sensed level of ception.

A comparable sensing of structure can occur for an array of objects. Consider, for example, a first object with the envelope/interior structure characterized above, where a second object is located at a point or points of the interior space of the first object. Examples might be some water in a vase or a radio in a dumpster. On ceiving such a complex, one may sense in it a structural schema of "inclusion," with the second object included within the first. As in the single-object case, this object array also exhibits a number of topology-like neutralities. Thus, not only can the first object and the second object themselves each vary in magnitude and shape, but in addition the first object can exhibit any orientation relative to the second object and can be located throughout any portion or amount of the second object's interior space, while still being sensed as manifesting the "inclusion" schema.

For a more intricate example, when one views the interior of a restaurant, one senses a hierarchically embedded structure in space that includes the schematic delineations of the dining hall as the largest containing frame, and the spatial pattern of tables and people situated within this frame. Perhaps one can see some of the hall's framing delineations concretely—for example, some ceiling-wall edges. But for the most part, the

patterned arrangement in space seems to be sensed. Thus, if one were to represent this sensed structure of the scene in a schematic drawing, one might include some lines to represent the rectilinear frame of the hall, together with some spots or circles for the tables and some short bent lines for the people that mark their relative positions within the frame and to each other. However, though it is representable thus, this is an abstraction that is for the most part not concretely seen as such, but rather only sensed as present.

Further cases perhaps also belong in this object-structure type of sensing. Thus, parts of objects that are not concretely seen but are known or assumed to be present in particular locations may be sensed as present at those locations. This may apply to the part of an object that is being occluded by another object in front of it, or to the back or underside of an object not visible from a viewer's current perspective.[16]

9.4.2 The Sensing of Path Structure When one views an object moving with respect to other objects, one concretely sees the path it executes as having Euclidean specifics such as exact shape and size. But in addition, one may sense an abstract structure in this path. The path itself would not be a case of fictive motion, for the path is factive. But the path is sensed as instantiating a particular idealized path schema, and it is this schema that is fictive. We term this the **sensing of path structure**. Thus, one may sense as equal instantiations of an "across" schema both the path of an ant crawling from one side of one's palm to the opposite side, and the path of a deer running from one side of a field to the opposite side. This visually sensed "across" schema would then exhibit the topological property of being magnitude neutral. Comparably, one may equally sense an "across" schema in the path of a deer running in a straight perpendicular line from one boundary of a field to the opposite boundary, and in the path of a deer running from one side of the field to the other along a zig-zag slanting course. The visually sensed "across" schema would then also exhibit the topological property of being shape neutral.

9.4.3 The Sensing of Reference Frames Perhaps related to the sensing of object/array structure is the **sensing of a reference frame** as present amidst an array of objects. For example, in seeing the scenery about oneself at the concrete level of palpability, one can sense a grid of compass directions amidst this scenery. Such compass directions are not concretely seen, but solely sensed at the semiabstract level of palpability.

One may even have a choice of alternative reference frames to sense as present (as described in chapter I-3). For example, consider a person who is looking at a church facing eastward toward the right with a bicycle at its rear. That person can sense within this manifest scene an earth-based frame, in which the bike is *west* of the church. Or she can sense the presence of an object-based frame, in which the bike is *behind* the church. Or she can sense the presence of a viewer-based frame radiating out from herself, in which the bike is to the *left* of the church. Levinson (1996b) and Pederson (1993) have performed experiments on exactly this issue, with findings of strong linguistic-cultural biasing for the particular type of reference frame that is sensed as present.

One may also sense the presence of one or another alternative reference frame for the case of a moving object executing a path. Thus, on viewing a boat leaving an island and sailing an increasing distance from it, one can sense its path as a radius extending out from the island as center within the concentric circles of a radial reference frame. Alternatively, one can sense the island as the origin point of a rectilinear reference frame and the boat's path as an abscissal line moving away from an ordinate.[17]

9.4.4 The Sensing of Structural History and Future Another possible type of sensed phenomenon also pertains to the structure of an object or of an array of objects. Here, however, this structure is sensed not as statically present but rather as having shifted into its particular configuration from some other configuration. In effect, one senses a probable, default, or pseudohistory of activity that led to the present structure. We term this the **sensing of structural history**. A sensed history of this sort is the visual counterpart of the fictive site-arrival paths described for language in section 8.3. The examples of visual counterparts already given in that section were of a figurine perceived as a torso with head and limbs affixed to it; of an irregular contour perceived as the result of processes like indentation and protuberation; and of a Pac Man figure perceived as a circle with a wedge removed.

In addition to such relatively schematic entities, it can be proposed that one regularly senses certain complex forms within everyday scenes not as static configurations self-subsistent in their own right but rather as the result of deviation from some prior, generally more basic, state. For example, on viewing an equal-sided picture frame hanging on the wall at an oblique angle, one may not ceive the frame as a static diamond shape, but may rather sense it as a square manifesting the result of having been tilted

away from a more basic vertical-horizontal orientation. Another example is the sensing of a dent in a fender not as a sui generis curvature but as the result of a deformation. One senses a set of clay shards not as an arrangement of separate distinctively shaped three-dimensional objects but as the remains of a flowerpot that had been broken. One may even sense toys that are lying over the floor not simply as comprising some specific spatial static pattern but rather as manifesting the result of having been scattered into that configuration from a home location within a box.

Viewing an entity may lead one to sense not only a history of its current configuration, but also to sense a potential or probable future succession of changes away from its current configuration. Such a **sensing of structural future** might involve the return of the entity to a basic state that it had left. For example, on viewing the previous picture frame hanging at an angle, one may sense its potential return to the true (probably as part of imagining one's manipulations to right it).

In terms of general fictivity, the sensing of an entity's structural history or future is a less veridical representation of fictive motion in a sensory modality. It is superimposed on the factively and veridically seen static representation of the entity. Thus, with respect to the picture-frame example, the difference between the factive and the fictive modes of ceiving the frame is the difference between, on the one hand, seeing a static diamond and, on the other hand, sensing a square with a past and a future.

9.4.5 The Sensing of Projected Paths Another type of sensed ception can be termed the **sensing of projected paths**. One form of path projection is based on motion already being exhibited by a Figure entity—for example, a thrown ball sailing in a curve through the air. A viewer observing the concretely occurrent path of the object can generally sense —but not palpably see—the path that it will subsequently follow. Here, we do not refer simply to unconscious cognitive computations that, say, enable the viewer to move to the spot at which she could catch the ball. Rather, we refer here to the conscious experience a viewer often has of a compelling sense of the specific route that the object will traverse. One may also project backward to sense the path that the ball is likely to have traversed before it was in view. Path projection of this sort is thus wholly akin to the sensing of structural history and future discussed in the preceding section. The main difference is that there the viewed entity was itself stationary, whereas here it is in motion. Accordingly, there the sensed changes before and after the static configuration were largely

associations based on one's experience of frequent occurrence, whereas here the sensed path segments are projections mostly based on one's naive physics applied to the viewed motion.

Another form of projected path pertains to the route that an agentive viewer will volitionally proceed to execute through some region of space. It applies, for example, to a viewer standing at one corner of a restaurant crowded with tables who wants to get to the opposite corner. Before starting out, such a viewer will often sense at the semiabstract level of palpability an approximate route curving through the midst of the tables that he could follow to reach his destination. The viewer might sense the shape of this path virtually as if it were taken by an aerial photograph. It may be that the initially projected route is inadequate to the task, and that the route-sensing process is regularly updated and re-projected as the viewer moves along his path. But throughout such a process, only the physical surroundings are seen concretely, whereas the path to follow is sensed. This form of projected path is akin to the linguistic fictive access paths described in section 8.4.

9.4.6 The Sensing of Force Dynamics Also at the semiabstract level of palpability is the **sensing of force dynamics**—that is, of the force interrelationships among otherwise concretely seen objects. Included in such sensed force dynamics are the interactions of opposing forces such as an object's intrinsic tendency toward motion or rest; another object's opposition to this tendency; resistance to such opposition; the overcoming of resistance; and the presence, appearance, disappearance, or absence of blockage. (See chapter I-7 for an analysis of the semantic component of language that pertains to force dynamics.)

To illustrate, Rubin (1986) and Engel and Rubin (1986) report that subjects perceive (in our terms, sense) forces at the cusps when viewing a dot that moves along a path like that of a ball bouncing. When the bounce is progressively heightened, the perception is that a force has been added at the cusps. Complementarily, when the dot's bounce is reduced, the force is perceived as being dissipated. Further, Jepson and Richards (1993), using two equal rectangles arranged to form a "T," note that when this T is on its side with the T's "head" rectangle vertical and its "stem" rectangle horizontal, then the percept is as if the stem rectangle is "attached" or glued to the head rectangle, analogously to what is sensed in the viewing of an object stuck to a wall. But there is no such perception of an "attaching force" when the T is upside down with its head rectangle

horizontal on the bottom and its stem rectangle vertical on top. In this case, only contact, not attachment, is perceived, just as what would be expected in viewing an object resting on a horizontal surface.

For a less schematic example, consider a scene in which a large concrete slab is leaning at a 45° angle against the outer wall of a rickety wooden shed. A person viewing this scene would probably not only see at the concrete level the slab and the shed in their particular geometric relationship, but also would sense a force-dynamic structure implicit throughout these overt elements. This sensed force structure might include a force (manifested by the shed) that is now successfully but tenuously resisting an unrelenting outside force impinging on it (manifested by the slab) and that is capable of incrementally eroding and giving way at any moment.

9.4.7 The Sensing of Visual Analogs to Fictive Motion in Language

Finally, the set of fictive motion types presented in this chapter before this section on ception can now be recalled for their relevance to the present discussion. Most of the visual patterns previously suggested as counterparts of the linguistic fictive motion types seem to fit at the semiabstract level of palpability—that is, they are sensed. Further, in terms of general fictivity, these visual analogs have involved the sensing of fictive *motion*; they do not involve the sensing of fictive *presence* (as was the case for the representations of "structurality" just seen). As a summary, we can list here the fictive types from sections 2.5 and 8, all of which participate in this phenomenon. Thus, we may sense at the semiabstract level of palpability the fictive motion of the visual counterparts of orientation paths (including prospect paths, alignment paths, demonstrative paths, and targeting paths), radiation paths, shadow paths, sensory paths, pattern paths, frame-relative motion, advent paths, access paths, and coextension paths. With the addition of the cases of structural history/future and projected paths characterized just above, this is a complete list of the fictive types proposed, in this chapter, to have a visual representation sensed as fictive motion.

9.5 The Abstract Level of Palpability

The cases cited so far for the first three levels of palpability have all depended on concurrent online sensory stimulation (with the exception that afterimages, artificial scotomas, and phosphenes require stimulation shortly beforehand). But we can adduce a level still further down the

palpability gradient, the (fully) abstract level. At this level, one experiences conceptual or affective entities that do not require online sensory stimulation for their occurrence and may have little direct relation to any such stimulation. Largely clustering near the lower ends of the remaining palpability-related parameters, such entities are thus largely impalpable, abstract, vague, and perhaps faint, lacking in ostensive characteristics, not amenable to localization in space, and not readily amenable to identification as to category. They are often experienced as subjective, hence, existing in oneself rather than "out there."

Such conceptual and affective entities do seem to exhibit a range of settings along the remaining palpability-related parameters. Thus, they can range from full salience in attention to elusiveness or virtual inaccessibility to consciousness; one can range from certainty to puzzlement over them; and one may range from a capacity to manipulate them in one's mind to an experience of being only a passive receptor to them. Finally, they can exhibit either content or structure, and, insofar as they manifest a type of geometry, this, too, can exhibit a range, though perhaps tending toward the approximative and qualitative type.

Such abstract entities may be ceived as components in the course of general ongoing thought and feeling. They might include not only the imagined counterparts of entities normally ceived as a result of online stimulation—for example, the experience only in imagination of the structure that one would otherwise sense online while viewing an object or array in space. But they might also include phenomena that cannot normally or ever be directly ascribed as intrinsic attributes to entities ceived as the result of online sensory stimulation. Such phenomena might include the following: the awareness of relationships among concepts within one's knowledge representation; the experience of implications between sets of concepts, and the formation of inferences; assessments of veridicality; and assessments of change occurring over the long term. Further possible inclusions are experiences of social influence (such as permissions and requirements, expectations and pressures); a wide range of affective states; and "propositional attitudes" (such as wish and intention).

Many cognitive entities at the abstract level of palpability are the semantic referents of linguistic forms, and so can also be evoked in awareness by hearing or thinking of those forms. These forms themselves are fully concrete when heard, and of course less concrete when imagined in thought. But the degree of concreteness that they do have, it seems, tends to lend a measure of explicitness to the conceptual and affective phe-

nomena that are associated with them. And with such greater explicitness may come greater cognitive manipulability (actionability) and access to consciousness. However, these are phenomena that, when experienced directly without association with such linguistic forms, may be at the fully abstract level of palpability. Despite such upscaling lent by linguistic representation, it is easiest to give further examples of ceptually abstract phenomena by citing the meanings of certain linguistic forms. Since open-class forms tend to represent more contentful concepts, while closed-class forms tend to represent more structural—and hence, more abstract—concepts, we next cite a number of closed-class meanings so as to further convey the character of the fully abstract end of the palpability gradient, at least insofar as it is linguistically associated.[18]

First, a schematic structure that one might otherwise sense at the semi-abstract level of palpability through online sensory stimulation—as by looking at an object or scene—can also be ceived at the fully abstract, purely ideational level in the absence of current sensory stimulation by hearing or thinking of a closed-class linguistic form that refers to the same schematic structure. For example, on viewing a scene in which a log is straddling a road, one might sense the presence of a structural "across" schema in that scene. But one can also ceive the same "across" schema at the abstract level of palpability by hearing or thinking of the word *across* either alone or in a sentence like *The log lay across the road.*

We can next identify a number of conceptual categories expressed by linguistic closed-class forms that are seemingly never directly produced by online sensory stimulation. Thus, the conceptual category of "tense," with such specific member concepts as 'past', 'present', and 'future', pertains to the time of occurrence of a referent event relative to the present time of speaking. This category is well represented in the languages of the world, but it has seemingly scant homology in the forms of ception higher on the palpability scale that are evoked by current sensory stimulation. A second linguistically represented category can be termed "reality status"—a type largely included under the traditional linguistic term "mood." For any event being referred to, this category would include such indications as that the event is actual, conditional, potential, or counterfactual, and would also include the simple negative (e.g., English *not*). Again, aspects of situations that are currently seen, heard, smelled, and so on at the concrete level or sensed at the semiabstract level are seemingly not ceived as having any other reality status than the actual. Similarly, the linguistically represented category of "modality," with such member notions as

those expressed by English *can*, *must*, and *should*, has little concrete or sensed counterpart.

To continue the exemplification, a further set of categories at the abstract level of palpability that can be evoked by closed-class forms pertain to the cognitive state of some sentient entity. These categories, too, seem unrepresented at the higher levels of palpability. Thus, a conceptual category that can be termed "speaker's knowledge status," represented by linguistic forms called "evidentials," particularizes the status of the speaker's knowledge of the event that she is referring to. In a number of languages (e.g., in Wintu, where it is expressed by inflections on the verb), this category has such member notions as 'known from personal experience as factual', 'accepted as factual through generally shared knowledge', 'inferred from accompanying evidence', 'inferred from temporal regularity', 'entertained as possible because of having been reported', and 'judged as probable'. Another linguistic category of the cognitive-state type can be termed the "addressee's knowledge status." This is the speaker's inference as to the addressee's ability to identify some referent that the speaker is currently specifying. One common linguistic form representing this category is that of determiners that mark definiteness—for example, the English definite and indefinite articles *the* and *a*. Further grammatically represented cognitive states are intention and volition, purpose, desire, wish, and regret.

For some final examples, a linguistic category that can be termed "particularity" pertains to whether an entity in reference is to be understood as unique (*That bird just flew in*), or as a particular one out of a set of comparable entities (*A bird just flew in*), or generically as an exemplar standing in for all comparable entities (*A bird has feathers*). But the online ception of an entity at the concrete or semiabstract level may not accommodate this range of options. In particular, it apparently tends to exclude the generic case—for instance, looking at a particular bird may tend not to evoke the ception of all birds generically. Thus, the ception of genericness in human cognition may occur only at the abstract level of palpability. Finally, many linguistic closed-class forms specify a variety of abstract relationships, such as kinship and possession. The English ending *'s* can express both of these relationships, as in *John's mother* and *John's book*. Again, online ception, such as viewing John in his house and Mrs. Smith in hers, or viewing John in the doorway and a book on the table, may not directly evoke the relational concepts of kinship and possession that the linguistic forms do.[19]

10 FURTHER TYPES AND PROPERTIES OF CEPTION

The full structure of the entire system of ception certainly remains to be characterized. But some brief notes here will sketch in a few lineaments of that structure. We cite some further types of ception, some forms of dissociation across the palpability-related parameters outlined above, and some differences among the various sensory modalities as to their parametric behavior.

10.1 Imagistic Forms of Ception

What can be termed **imagistic ception** includes such forms of cognitive representation as mental imagery, of course regardless of whether this is related to vision or to other sensory modalities. Along the gradient parameter of stimulus dependence, imagistic ception seems to fall in the midrange. That is, it can be evoked in association with an entity ceived at the concrete level during online stimulation by that entity. For example, on seeing a dog, one can imagine the sight and sound of it starting to bark, as well as the sight and kinesthesia of one's walking over and petting it. But imagistic ception can also occur without online stimulation, as during one's private imaginings. It needs to be determined whether imagistic ception can also occur at the low end of the stimulus-dependence parameter—that is, whether aspects of it are unrelated to sensory attributes, as in the case of many conceptual categories of language.

10.2 Associative Forms of Ception

What can be termed **associative** forms of ception pertain to ceptual phenomena that are evoked in one in association with an entity during one's online sensory stimulation by it, but that one does not ascribe to that entity as intrinsic attributes of it. Such associated phenomena could include: (1) mental imagery, as just discussed; (2) actions that one might undertake in relation to the entity; (3) affective states that one experiences with respect to the entity; (4) particular concepts or aspects of one's knowledge that one associates with the entity; and (5) inferences regarding the entity.

Having already discussed mental imagery, we can here illustrate the remaining four of these types of associative ception. As examples of associated action (2), on viewing a tilted picture frame, one might experience a motoric impulse to manipulate the frame so as to right it. Or, on viewing a bowling ball inexorably heading for the side gutter, one might

experience or execute the gyrations of "body English" as if to effect a correction in the ball's path.

In fact, with respect to such kinesthetic effects, there may be a gradient of palpability—parallel to what we have posited for ception—that applies to motor control. Proceeding from the least to the most palpable, at the low end would be one's experience of intending to move; in the midrange would be one's experience of all-but-overt motion, including checked movement and covert body English; and at the high end would be one's experience of one's overt movements.

Associated affect (3) has such straightforward examples as experiencing pleasure, disgust, or fear at the sight of something—for example, of a child playing, of roadkill, or of a mugger. Associated knowledge or concepts (4) could include examples like thinking of danger on seeing a knife, or thinking of one's childhood home on smelling fresh bread. And examples of associated inference (5) might be gathering that Mrs. Smith is John's mother from the visual apparency of their ages and of their resemblance, or inferring that a book on a table belongs to John from the surroundings and John's manner of behaving toward it.

10.3 A Parameter of Intrinsicality

Associative forms of ception like those just adduced may be largely judged to cluster near the semiabstract level of palpability. In fact, the phenomena described in section 9.4 as "sensed" at the semiabstract level and the associative phenomena reported here may belong together as a single group ceived at the semiabstract level of palpability. But the sensed type and the associative type within this group would still differ from each other with respect to another gradient parameter, what might be called **intrinsicality**. At the high end of this gradient, the sensed phenomena would be experienced as intrinsic to the entity being ceived at the concrete level. That is, one would ceive them as being actually present and perhaps as inherent attributes—such as structure and patterns of force impingement—that one, as ceiver, is "detecting" in the concretely seen entity. But, at the lower end of the intrinsicality gradient, the associative phenomena presented here would be experienced as merely associated with the concretely ceived entity. That is, one would experience them as incidental phenomena that one, as ceiver, brings to the entity oneself.

This intrinsicality parameter, however, is actually just the objectivity gradient (parameter 5) when it is applied to phenomena associated with an entity rather than to the entity itself.

To be sure, where a particular phenomenon is placed along the intrinsicality gradient varies in accordance with the type of phenomenon, with the individual, with the culture, and with the occasion. For a classical example, if one ceives beauty in conjunction with seeing a particular person, one may experience this beauty as an intrinsic attribute of the person seen, much like their height. Alternatively, one may experience the beauty as one's personal interpretive response—that is, as produced by oneself as the beholder.

10.4 Dissociations among the Palpability-Related Parameters

While the 13 palpability-related parameters generally tend to correlate with one another for the types of ception that had been considered, some dissociations can be observed. For example, with respect to the imagistic forms of ception, visual mental imagery can have a fairly high degree of ostension (parameter 4)—for instance, having relatively definite form and movement. At the same time, however, it may rank somewhere between the semiconcrete level and the semiabstract level along the palpability gradient (parameter 1) and at a comparably midrange level along the clarity gradient (parameter 2). For another case of dissociation, already noted, the cognitive phenomena expressed by closed-class linguistic forms are generally at the most abstract level of the palpability gradient (parameter 1). But the conscious manipulability of the linguistic forms that express these conceptual phenomena ranks them near the high end of the actionability gradient (parameter 12). Or again, some affective states may rank quite low on most of the parameters—for example, intangible on the palpability gradient (1), murky on the clarity gradient (2), and nonostensive on the gradient of ostension (4)—while ranking quite high on the intensity gradient (3) because they are experienced as intense and vivid. The observation of further dissociations of this sort can argue for the independence of the parameters adduced and ultimately justify their identification as distinct phenomena.

10.5 Modality Differences along the Palpability Gradient

In the discussion on ception, we have mostly dealt with phenomena related to the visual modality, which can exhibit all levels along the palpability gradient except perhaps the most abstract. But we can briefly note that each sensory modality may have its own pattern of manifestation along the various palpability-related parameters adduced. For example, the kinesthetic modality, including one's sense of one's current body

posture and movements, may by its nature seldom or never rank very high along the palpability, clarity, and ostension parameters, perhaps hovering somewhere between the semiconcrete and the semiabstract level. The modality of smell, at least for humans, seems to rank low with respect to localizability (parameter 6). And the modalities of taste and smell, as engaged in the ingestion of food, may range more over the content region than over the structure region of the content/structure parameter (parameter 8). Comparison of the sensory modalities with respect to ception requires much further investigation.

11 CONTENT/STRUCTURE PARALLELISMS BETWEEN VISION AND LANGUAGE

The analysis to this point permits the observation of two further parallelisms between vision and language.

11.1 The Complementary Functions of the Content and Structure Subsystems in Vision and Language

First, each of the two cognitive systems, vision and language, has a content subsystem and a structure subsystem. Within online vision—for example, in the viewing of an object or array of objects—the content subsystem is foremost at the concrete level of palpability, while the structure subsystem is foremost at the semiabstract level of palpability. In language, the referents of open-class forms largely manifest the content subsystem, while the referents of closed-class forms are generally limited to manifesting the structure subsystem. The two subsystems serve largely distinct and complementary functions, as will be demonstrated next, first for vision and then for language. A number of properties from both the content/structure parameter (8) and the type-of-geometry parameter (9) align differentially with the distinctive functioning of these two subsystems. These properties include ones pertaining to bulk as against lineaments, Euclidean geometry as against topology, absoluteness as against relativity, precision as against approximation, and, holistically, a substantive summary as against a unifying framework.[20]

We can first illustrate the properties and operations of the two subsystems in vision. For a case involving motor planning and control, as in executing a particular path through space, the content subsystem is relevant for fine-grained local calibrations, while the structure subsystem can

project an overall rough-and-ready first approximation. Thus, to revisit an earlier example, a person wanting to cross the dining area of a restaurant will likely plot an approximate, qualitative course curving through the tables, using the sensed semiabstract level of structure in a spatial array. But in the process of crossing, the person will attend to the Euclidean particulars of the tables, using the concrete level of specific bulk content, so as not to bump into the tables' corners. If such were possible, a person operating without the overall topology-like subsystem would be reduced to inching along, using the guidelines of the precision subsystem to follow the sides of the tables and the curves of the chairs, without an overarching schematic map for guidance. On the other hand, a person lacking the precision subsystem might set forth on her or his approximate journey but encounter repeated bumps and blockages for not being able to gauge accurately and negotiate the local particulars. The two subsystems thus perform complementary functions and are both necessary for optimal navigation, as well as other forms of motor activity.

We can next illustrate the two subsystems at work in language. To do this, we can observe the distinct functions served by the open-class forms and by the closed-class forms in any single sentence. Thus, consider the sentence *A rustler lassoed the steers*. This sentence contains just three open-class forms each of which specifies a rich complex of conceptual content. These are the verb *rustle*, which specifies notions of illegality, theft, property ownership, and livestock; the verb *lasso*, which specifies a rope looped and knotted in a particular configuration that is swung around, cast, and circled over an animal's head in a certain way; and *steer*, which specifies notions of a particular animal type, the institution of breeding for human consumption, and castration.

On the other hand, the sentence contains a number of closed-class forms that specify relatively spare concepts serving a structuring function. These include the suffix *-ed* specifying occurrence before the time of the current speech event; the suffix *-s* specifying multiple instantiation, and the "zero" suffix (on *rustler*) specifying unitary instantiation; the article *the* specifying the speaker's assumption of ready identifiability for the addressee and the article *a* that specifies the opposite of this, and the suffix *-er* specifying the performer of an action. Further inclusions are the grammatical category of "noun" (for *rustler* and *steers*) indicating an object and that of "verb" (for *lassoed*) indicating a process, and the grammatical relation of "subject" indicating an Agent and that of "direct object" indicating a Patient.

The distinct functions served by these two types of forms can be put into relief by alternately changing one type of form in the above sentence while keeping the other constant. Thus, we can change only the closed-class forms, as in a sentence like *Will the lassoers rustle a steer?*. Here, all the structural delineations of the depicted scene and of the speech event have been altered, but since the content-specifying open-class forms are the same, we are still in a Western cowboy landscape. But we can now change only the open-class forms, as in *A machine stamped the envelopes*. Here, the structural relationships of the scene and of the speech event are the same as in the original sentence, but with the content-specifying forms altered, we are now transposed to an office building. In sum, then, in the referential and discourse context of a sentence, the open-class forms of the sentence contribute the majority of the content, whereas the closed-class forms determine the majority of the structure.

Thus, both in ceiving and motorically negotiating a visual scene and in cognizing the reference of a sentence, the two cognitive subsystems of content and of structure are in operation, performing equally necessary and complementary functions, as they interact with each other.

11.2 Comparable Character of the Structure Subsystem in Vision and in Language

Given this demonstration that visual perception and language each have a content subsystem and a structure subsystem, we next need to determine the relationship between the two content subsystems and the relationship between the two structure subsystems. Focusing here only on the latter issue, we find that the structural subsystem in vision and that in language exhibit great similarity.

First, recall that section 9.4 on ception at the semiabstract level of palpability proposed that we can sense the spatial structure and force-related structure of an object or an array of objects when viewing it. It was suggested that any structure of this sort is sensed as consisting of an idealized abstracted schema with a topology-like or other qualitative type of geometry. And recall from the preceding subsection that the linguistic system of closed-class forms is dedicated to specifying the structure of some part of or the whole of a conceptual complex that is in reference. Note now, then, that when such linguistically specified structure pertains to space or force, it, too, consists of idealized abstracted schemas with topology-like properties. In fact, the character of the structuring yielded by visual sensing and that yielded by the linguistic closed-class system appear to be highly similar.

The structure subsystems of vision and language exhibit a further parallel, one that pertains to fictivity. Recall the observation in section 9.4 that the structural schemas that one semiabstractly senses to be present in an object or array are assessed as being fictive, relative to the factive status of the way one concretely sees the object or array. Now, the structural schemas expressed by linguistic closed-class forms—here, specifically, those pertaining to space and force—are also fictive representations, relative to the factive character of the objects and arrays that a language user understands them to pertain to. That is, all these cases of abstracted or conceptually imposed schemas—whether sensed visually or specified by linguistic closed-class forms—can be understood as a form of fictivity. They constitute not fictive motion but fictive presence—here, the fictive presence of structure. Accordingly, the extensive body of linguistic work on spatial schemas—for instance, Talmy 1975b, 1983 and Herskovits 1986, 1994, among much else—constitutes a major contribution to fictivity theory. In particular, Herskovits has made it a cornerstone of her work to treat the spatial schemas that she describes as "virtual structures" (previously termed "geometric conceptualizations"), which are to be distinguished from the "canonic representations" of objects "as they are."

With the preceding as the general picture, we now point to some particular cases of parallelism between the structure subsystem of vision and that of language. With respect to the structure of an array of objects, it was proposed in section 9.4.1 that one can visually sense the presence of an "inclusion" type of structural schema on viewing a two-object complex in which one object is sensed as located at a point or points of the interior space defined by the other object. This schema can be topologically or qualitatively abstracted away from particulars of the objects' size, shape, state of closure, discontinuity, relative orientation, and relative location. Now, the spatial schema specified by the English preposition *in* exhibits all these same properties. This closed-class form can thus be used with equal appropriateness to refer to some object as located *in a thimble, in a volcano, in a well, in a trench, in a beachball, in a punchbowl, in a bell jar*, or *in a birdcage*. Further, it can be said that in abstracting or imposing their schema, the structure subsystems of both vision and language produce a fictive representation, relative to the concreta of the object array.

Comparably, section 9.4.2 addressed the topology-like properties of the structure sensed in the path of a viewed moving object. But this type of

visually sensed structure also has linguistic closed-class parallels. Thus, the English preposition *across*—which specifies a schema prototypically involving motion from one parallel line to another along a perpendicular line between them—exhibits the topological property of being magnitude neutral. This is evident from the fact that it can be applied to paths of a few centimeters, as in *The ant crawled across my palm*, as well as to paths of thousands of miles, as in *The bus drove across the country*. In a related way, the preposition *through* specifies (in one sector of its usage) a schema involving motion along a line that is located within a medium. But, topology-like, this schema is shape neutral. Thus, *through* can be applied equally as well to a looped path, as in *I circled through the woods*, as to a jagged path, as in *I zigzagged through the woods*. And, again, the topological schemas thus visually sensed in or linguistically imputed to a path are fictive representations relative to the Euclidean particulars seen or believed to be present.

For a final case of a vision-language parallelism of structure, section 9.4.3 suggested that on viewing certain scenes one may sense the presence of either a rectilinear or a radial reference frame as the background against which an object executes a path. But these two alternate schemas can also be represented by closed-class forms in language. Thus, English *away from* indicates motion from a point on an ordinate-type boundary progressing along an abscissal-type axis within a rectilinear grid. But *out from* indicates motion from a central point along a radius within a radial grid of concentric circles. These alternative conceptual schematizations can be seen in sentences like *The boat drifted further and further away|out from the island*, or *The sloth crawled 10 feet away|out from the tree trunk along a branch*. Here, both reference frames are again clearly fictive cognitive impositions on the scene, whether this scene is viewed visually or referred to linguistically.

In sum, the characteristics comparable across visual and linguistic structuring of space and force include the following: they both have comparable schematic abstractions; in both, these abstractions are topology-like; and in both, these abstractions are fictive. The following summary statement may capture the comparability of linguistic and perceptual structuring, as long as it is interpreted within this chapter's context of explanation and terminology: One understands or expresses grammatically much of what one senses visually.

11.3 Possible Neural Bases for the Similarity of Structure between Vision and Language

One can heuristically explore ideas for a neural basis for the similarities just discussed between the structure subsystem of visual perception and that of language.

One possibility is that some particular neural system, independent of both vision and language, is responsible for processing schematic structure in general. Then we can suppose that both visual sensing and linguistic closed-class representation are connected into that single neural system for this common characteristic of their mode of functioning.

Another possibility is that a neural subsystem for processing schematic structure is included within the neural system that underlies visual perception, and that the neural system that underlies language has connections to this structure-processing subsystem, from which it secondarily derives its structuring functions—those associated with closed-class forms. For this possibility, we have posited the structuring subsystem as located within the visual system, since vision is evolutionarily prior to language. As the language system evolved, it may have connected with the structuring subsystem already present within visual perception.

A third possibility is that two approximate duplicates of a neural subsystem for processing schematic structure exist, one occurring within the neural system underlying visual perception, and the other in the neural system underlying language.

Apart from these possibilities of where it appears, the hypothesized neural system or subsystem for processing schematic structure should be accorded one further characteristic. The schematic structures that are the products of its processing are experienced as being less veridical, hence, fictive, relative to the products of certain other neural systems, those that process the concrete ostensions of ceived entities.

11.4 Structural Explicitness in Vision and Language

The cognitive system pertaining to vision in humans has another feature that may have a partial counterpart in language. It has a component for representing in an explicit form the kinds of schematic structures generally only implicitly sensed at the semiabstract level of palpability. We here call this the component for **schematic pictorial representation**.

In iconographic representation, a full-blown pictorial depiction manifests the content subsystem. But the structure subsystem can be made

explicit through the component of schematic pictorial representation by schematic depictions involving the use of points, lines, and planes, as in both static and filmic cartoons and caricatures, line drawings, wire sculptures, and the like. The very first pictorial depictions that children produce—their "stick-figure" drawings—are of this schematic kind. For example, a child might draw a human figure at an early phase as a circle with four lines radiating from it, and later as a circle atop a vertical line from which two lines extend laterally right and left at a midpoint and two more lines slope downward from the bottom point. Thus, in depicting an object or scene that he has viewed, a child represents not so much its concrete-level characteristics as the structure that he can sense in it at the semiabstract level of palpability.

It must be emphasized that such schematizations are not what impinges on one's retinas. What impinges on one's retinas are the particularities of ostension: the bulk, edges, textures, shadings, colorings, and so on of an entity looked at. Yet, what emerges from the child's hand movements are not such particulars of ostension, but rather one-dimensional lines forming a structural schematic delineation. Accordingly, much cognitive processing has to occur between the responses of the retinas and these hand motions. This processing in a principled fashion reduces, or "boils down," bulk into delineations.

As proposed in this study, such structural abstractions are in any case necessary for the ception of visual form, both of single objects and of object arrays (see Marr 1982), and constitute a major part of what is sensed at the semiabstract level of palpability. And as proposed in the preceding section, this ception of structural abstraction may be the product of a specific cognitive system. It then appears that the component of the visual system involved in producing external depictions taps specifically into this same abstractional schematic structuring system. In fact, in the developmentally earliest phase of its operation, a child's iconographic capacity would appear to be linked mainly to this structure-processing system, more so than to the cognitive systems for concretely ceiving the full ostension of objects.

The component of language that may partially correspond to this representational explicitness is the closed-class system itself, as characterized in the preceding subsection. The linguistic linkage of overt morphemes to the structural schemas that they represent lends some concreteness to those cognitive entities, otherwise located at the fully abstract level of palpability. These morphemes constitute tangible counterparts to the

abstract forms, permit increased actionability upon them, and perhaps afford greater conscious access to them. The form of such morphemes, however, does not reflect the form of the schemas that they represent, and in this way, this language component differs crucially from the pictorial schematic representations, which do correspond in structure to what they represent.

While this section has pointed to parallelisms of structure between vision and language, it remains to chart the differences. It may be expected that the structure subsystems in vision and language differ in various respects as to what they treat as structural, their degree and type of geometric abstraction, the degree and types of variation that such structural features can exhibit across different cultural groups, and the times and sequences in which these structural features appear in the developing child.

11.5 Some Comparisons with Other Approaches

The present analysis raises a challenge to the conclusions of Cooper and Schacter (1992). They posit "explicit" and "implicit" forms of visual perception of objects—apparently the concepts in the literature closest to this chapter's concepts of the concrete and semiabstract levels of palpability. But they claim that their implicit form of perception is inaccessible to consciousness. We would claim instead, first, that entities such as structural representations that are sensed at the semiabstract level of palpability (like those treated in section 9.4) can in fact be experienced in awareness at least at a vague or faint degree of clarity, rather than being wholly inaccessible to consciousness. And, second, the fact that vision and language—both largely amenable to conscious control—can generally render the structural representations of the structure subsystem explicit suggests that these representations were not inaccessibly implicit in the first place.

Separate cognitive systems for representing objects and spaces have been posited by Nadel and O'Keefe (1978), by Ungerleider and Mishkin (1982), and by Landau and Jackendoff (1993), who characterized them as the "what" and the "where" systems. To be sure, these systems fit well, respectively, into the content and structure subsystems posited in Talmy (1978c/1988b) and here. However, the "where" system would seem to comprise only a part of the structure subsystem, since the former pertains to the structural representation of an extended object array—the field with respect to which the location of a Figure object is characterized—

whereas the latter also includes the structural representation of any single object.

12 THE RELATION OF METAPHOR TO FICTIVITY

Metaphor theory, in particular as expounded by Lakoff and Johnson (1980), accords readily with general fictivity. The source domain and the target domain of a metaphor supply the two discrepant representations. The representation of an entity within the target domain is understood as factive and more veridical. The representation from the source domain that is mapped onto the entity in the target domain, on the other hand, is understood as fictive and less veridical.

For example, linguistic expressions often involve space as a source domain mapped onto time as a target domain. This can be seen in sentences like *The ordeal still lies ahead of us*, and *Christmas is coming*. Here, the static spatial relation of "frontality" is mapped onto the temporal relation of "subsequence," while the dynamic spatial relation of "approach" is mapped onto temporal "succession." In terms of general fictivity, factive temporality is expressed literally in terms of fictive spatiality here.

One observation arising from the fictivity perspective, perhaps not noted before, is that any of the Lakoff and Johnson's three-term formulas—for example, love is a journey, argument is war, seeing is touching—is actually a cover term for a pair of complementary formulas, one of them factive and the other fictive, as represented in (27).

(27) Fictive: X is Y
Factive: X is not Y

Thus, factively, love is *not* a journey, while in some fictive expressions, love *is* a journey. The very characteristic that renders an expression metaphoric—what metaphoricity depends on—is the fact that the speaker or hearer has somewhere within his cognition a belief about the target domain contrary to his cognitive representation of what is being stated about it, and has somewhere in his cognition an understanding of the discrepancy between these two representations.

One reason for choosing to adopt fictivity theory over metaphor theory as an umbrella aegis is that it is constructed to encompass cognitive systems in general rather than just to apply to language. Consider, for example, a subject viewing a round and narrow-gapped C-like figure. In terms of general fictivity, the subject will likely see a C at the con-

crete level of palpability—its factive representation. Concurrently for the same figure, she will sense a complete circle at the semiabstract level of palpability—its fictive representation. She will experience the former representation as more veridical and the latter one as less so, and may experience a degree of discrepancy between the two representations. This, then, is the way that the framework of general fictivity would characterize the Gestalt phenomenon of closure.

As for the framework of linguistic metaphor, if its terms were to be extended to cover vision, they might characterize the perception of the C figure as involving the mapping of a source domain of continuity onto a target domain of discontinuity, so that the subject experiences a visual metaphor of continuity. An extension of this sort should indeed be assayed. But at present, both psychologists and linguists might balk at the notion of closure as a metaphor. Meanwhile, the outline of a general framework for addressing such phenomena across cognitive systems is here in place.

13 FICTIVE X

In this section, we recap and augment the observations throughout the text that phenomena other than motion can have fictive status in both language and vision. The cognitive phenomenon of fictivity is more general than just fictive motion, in fact covering **fictive X**, where X can range over many conceptual categories.

To begin with, the counterpart of fictive motion, namely, fictive stationariness, has already been seen in frame-relative motion. In the examples given, when the scenery is fictively treated as moving toward the observer, the observer herself is fictively treated as stationary. In addition, certain linguistic formulations treat motion as if it were static. For example, instead of saying *I went around the tree*, which explicitly refers to my progressive forward motion, one can say *My path was a circle with the tree at its center*, which confines the fact of motion to the noun *path* and presents the remainder of the event as a static configuration.

Visual counterparts of fictive stationariness can be found in the viewing of such phenomena as a waterfall or the static pattern of ripples that can form at a particular location along a flowing stream. Here, one ceives a relatively constant configuration while all the physical material that constitutes the configuration constantly changes. This situation is the reverse of the "pattern paths" of section 8.1. There, the physical substance was

for the most part factively stationary, while the fictive pattern that it formed moved. Here, the physical material is factively moving, while the fictive pattern that it forms is stationary.

Comparably, fictive change in some property was already seen in the coextension path example in (26c): *The soil reddens toward the east*. Here, a factively static situation—a spatially distributed difference in color—is fictively reconstrued as a progressive change in color as one's attention fictively moves across the space. Another example of this type is *The road disappears for a while by the lake and then reappears toward the border*. Here, the factive spatial arrangement of two sections of road with no road between them is fictively construed as a single continuous entity, and as one fictively moves one's attention along this entity, it fictively changes from being present, to being absent, to being present again.

We can present another example for a further fictive category. Parallel to frame-relative motion and stationariness are frame-relative change and staticity. Exemplifying these two types is the following sentence that could be wryly uttered by a professor: *The entering freshmen keep getting younger*. Here, factively, the professor is getting older, while the students on average stay the same in age. But the sentence fictively depicts the professor as static in age, while the students change downward in age.

Visual perception may also exhibit fictive change and stasis without the involvement of motion. Although relevant experiments have apparently not been conducted, we can suggest a type of experiment to try. A subject would look at a central disk of one brightness encompassed by a surround of a different brightness. Then the surround is factively made brighter while the center factively retains its original brightness. Here, the subject may instead perceive the center as becoming darker while the surround remains the same. For such a subject, the center would be undergoing fictive change, while the surround exhibits fictive stasis.

Finally, recall that both language and visual perception exhibit fictive presence in the form of abstract schematic structure that they can impute to entities. Thus, the English preposition *in*, as used in a sentence of the form *X is in Y*, imputes an "envelope + interior" schema to Y. The delineations of this schema are not factively to be found in Y, hence we can say that this schema has a fictive presence in Y. And this schema is in fact conceptually imposed on Y regardless of Y's factive particulars of ostension. In a comparable way, as part of one's visual perception on viewing a human figure in some posture, one may fictively sense the presence within the bulk of the figure a schematic "stick figure" consisting

of a certain arrangement of axes of elongation—something that is not factively present in the human body.

14 A COGNITIVE BIAS TOWARD DYNAMISM

Now that we have further elaborated the nature of fictive motion and fictive stationariness, we can compare their relative frequency of occurrence in language and, perhaps also, in vision. In terms of metaphor theory, fictive motion in language can be interpreted as the mapping of motion as a source domain onto stationariness as a target domain. A mapping of this sort can be seen as a form of cognitive **dynamism**. Fictive stationariness, then, is the reverse: the mapping of stationariness as a source domain onto motion as a target domain. This sort of mapping, in turn, can be understood as a form of cognitive **staticism**. Given this framework, it can be observed that, in language, fictive motion occurs preponderantly more than fictive stationariness. That is, linguistic expressions that manifest fictive motion far outnumber ones that manifest fictive stationariness. In other words, linguistic expression exhibits a strong bias toward conceptual dynamism as against staticism.

The cognitive bias toward dynamism in language shows up not only in the fact that stationary phenomena are fictively represented in terms of motion more than the reverse. In addition, stationary phenomena considered by themselves can in some cases be represented fictively in terms of motion even more than factively in terms of stationariness. The factive representation of a stationary referent directly as stationary is what chapter I-1 terms the "synoptic perspectival mode," and—in a related way—what Linde and Labov (1975) term a "map," and what Tversky (1996) terms the "survey" form of representation. This is illustrated in (28a). Correspondingly, its fictive representation in terms of motion exemplifies Talmy's "sequential perspectival mode," and, comparably, what both Linde and Labov and Tversky term the "tour" form of representation, as illustrated in (28b).

(28) a. There are some houses in the valley.
b. There is a house every now and then through the valley.

While this example allows both modes of representation, other examples virtually preclude a static representation, permitting only a representation in terms of fictive motion for colloquial usage, as seen in (29).

(29) a. ??The wells' depths form a gradient that correlates with their locations on the road.
b. The wells get deeper the further down the road they are.

In a similar way, factively static phenomena in cognitive systems other than language may also be more readily cognized in fictively dynamic terms than in static terms. For example, in vision, on viewing a picture hanging on a wall at an angle, a person may more readily ceive the picture as a square that has been tilted out of true and that calls for righting, whereas he may require a special effort to ceive the picture statically as a diamond. Comparably, in the cognitive system of reasoning, one usually progresses through a proof step by step rather than seeing the full complement of logical relationships all at once.

In fact, cognitive dynamism is so much more the normal mode that the cognizing of staticism is often regarded as a special and valued achievement. Thus, an individual who suddenly ceives all the components of a conceptual domain as concurrently co-present in a static pattern of interrelationships is said to have an "aha experience." And an individual that ceives a succession of one consequent event after another through time as a simultaneous static pattern of relationships is sometimes thought to have had a visionary experience.

Notes

1. This chapter is a moderately revised version of Talmy 1996a.

I am grateful to Lynn Cooper, Annette Herskovits, Kean Kaufmann, Stephen Palmer, and Mary Peterson for much valuable discussion. And my thanks to Karen Emmorey for corroborative data on fictive motion in American Sign Language, most of which unfortunately still remains to be incorporated in an expanded version of this study.

2. This study is planned as the first installment on a more extensive treatment of all the fictive categories.

3. Bucher and Palmer (1985) have shown that, when in conflict, configuration can prevail over motion as a basis for ascription of "front" status. Thus, if an equilateral triangle moves along one of its axes of symmetry, then that line is seen as defining the front-back. Whether the triangle's vertex leads along the line of motion, or trails, it is still seen as the front. Where the vertex trails, the triangle is simply seen as moving backward.

4. Note that the notion of crossing behind a front-bearing object may be partially acceptable, possibly due to a conceptualization like this: The posited intangible line, while more salient in front, actually extends fully along the front-back axis of the object.

5. Due to the constraint noted above, this construction cannot refer to nonaligned fictive paths—for example, **The snake is lying past the light* to refer to a snake lying straight with its head pointing past the light. Still needing explanation, however, is why this construction can also not be used for aligned arrangements with path geometries other than 'toward' or 'away from', as in **The snake is lying into/out of the mouth of the cave* to refer to a snake lying straight with its head pointing into or out of a cave mouth.

6. The Experienced is optionally included in or omitted from the type of construction in (i).

(i) I looked into the valley (at the mound located in its center).

7. Other forms of agency probably function more poorly as models. Such other forms might include an Agent's affecting some cognitive state within herself (e.g., making herself feel happy), or an Agent's affecting some proximal physical object that she is already in contact with.

8. This mapping may be reinforced by the fact that the prospect path ascribed to an inanimate configuration, such as a cliff wall or a window, is often associated with an actual viewer located at that configuration and directing her or his visual path along the same path as the prospect line. Thus, in (i), one readily imagines a viewer standing at the cliff edge or in the bedroom looking out along the same path as is associated with the cliff wall or the window.

(i) a. The cliff wall faces/looks out toward the butte.
    b. The bedroom window faces/looks out/opens out toward the butte/onto the patio.

9. To note the correspondences, Jackendoff (1983) has abstracted a concept of pure "directedness" with four particularizations. The first of these is actual motion. The second is "extension" (e.g., *The road goes from New York to LA*), corresponding to our coextension paths. The third is "orientation" (e.g., *The arrow points to/toward the town*), which corresponds to the demonstrative subtype of our orientation paths. The fourth is "end location" (e.g., *The house is over the hill*), which corresponds to our access paths.

10. However, Karen Emmorey (personal communication) notes an apparent counterexample to this condition in American Sign Language. The example is where one signs that a car is racing across pavement and goes into a skid. She writes: "The signer uses the classifier for vehicles (thumb, index, and middle finger extended; palm oriented to left) to represent the car, and the classifier for flat objects (B handshape, fingers extended and touching, palm down) to represent the pavement. To show the pavement rushing past underneath the car, the B handshape moves rapidly back and forth under the vehicle classifier. This shows the fictive motion of the pavement. For this expression the vehicle classifier does not move. But then when the signer shows the car going into a skid, the vehicle classifier turns on its edge and moves in an arc. At the same time, the B handshape representing the avement rushing past continues to move."

11. Given the extent of frame-relative motion and its alternate reframings in human cognition and language, it can be posed as a puzzle why, in the history of the mainstream of scientific thought, it took so long for the idea of a rotating earth even to be considered as a possibility beside the idea of the sky or its luminous bodies as circling around the earth. One contributing element may be the apparent cognitive factor that stationariness, rather than either translational or rotary motion, is basic for an observer. This cognitive bias may have long tilted astronomical theorizing toward the view that the entities external to the earth are in motion relative to us.

12. The term and perhaps the basic concept of "ception" derive from a short unpublished paper by Stephen Palmer and Eleanor Rosch titled "'Ception': Per- and Con-." But the structuring of the ception concept found here, as well as the parameters posited to extend through it, belong to the present approach.

Already in common usage are other terms are neutral to any perception-conception distinction, though perhaps without much recognition of conferring that advantage. Such terms include "representation," to "experience," to "cognize," and sometimes "cognition." All these terms have their particular applications and will be used in this chapter. But the new term "ception" is specifically intended to emphasize the continuity across the larger domain and the existence of largely gradient parameters that span it.

13. Perhaps this parameter alone out of the 13 has an open-ended upper region, allowing increasingly greater degrees of intensity. Thus, the point along this parameter that would tend to correlate with the high ends of the other parameters should be located within its upper region.

14. Recall that this entry, like the others, is intended as a phenomenological parameter. An entity is assigned to the high end of the gradient because it is *experienced* as being "out there," not because it fits a category of a theoretical ontology according to the tenets of which the entity "*is*" out there.

Though the experience of external versus internal is the relevant issue for the present parameter, we can note that our usual scientific ontology would maintain something like the following about the perception of an entity that it takes to be located external to one's body. Once stimuli from the entity impinge on the body's sensory receptors, the neural processing of the stimuli, including the portion that leads to conscious experiencing of the entity, never again leaves the body. Despite this fact, we experience the entity as external. Our processing is specifically organized to generate the experience of the entity's situatedness at a particular external location. We lack any direct conscious experience that our processing of the entity is itself internal. In physiological terms, we apparently lack brain-internal sense organs or other neural mechanisms that register the interior location of the processing and that transmit that information to the neural consciousness system.

15. The adoption of the verb "to sense" as a term for this purpose is derived from its everyday colloquial usage, not from any other uses that this word may have been put to in the psychological literature.

16. See Petitot 1995 for a mathematical model of visual and linguistic structuring of objects in space.

17. As discussed in section 11.2, linguistic forms can select between these two reference-frame alternatives. Thus, English *away from* selects for the rectilinear frame, while *out from* selects for the radial frame, as in the following examples.

(i) The boat drifted further and further away/out from the island.
(ii) The sloth crawled 10 feet away/out from the tree trunk along a branch.

Perhaps related to the sensing of reference frames is the ception of geographic boundaries that are only partially or not at all based on concretely visible physical formations—what Smith (1995) terms "fiat boundaries."

18. As treated extensively in chapter I-1, open-class forms are categories of forms that are large and easily augmented, consisting primarily of the roots of nouns, verbs, and adjectives. Closed-class forms are categories of forms that are relatively small and difficult to augment. Included among them are bound forms like inflectional and derivational affixes; free forms like prepositions, conjunctions, and determiners; abstract forms like grammatical categories (e.g., "nounhood" and "verbhood" per se), grammatical relations (e.g., subject and direct object), and word order patterns; and complexes like grammatical constructions and syntactic structures.

19. We note that linguistic categories like the preceding have been presented only to help illustrate the abstract end of the palpability parameter, not because that parameter is relevant to general fictivity in language. It should be recalled that the palpability gradient has been introduced here mainly to help characterize general fictivity in vision. Though linguistic reference can be located along it, this parameter is not suitable for characterizing general fictivity in language. As discussed, general fictivity in language involves the discrepancy between the representation of one's belief about a referent situation and the representation of a sentence's literal reference. The mapping of two such language-related representations into the visual modality does tend to involve a palpability contrast, but the original two representations themselves do not.

20. Talmy (1978c, 1988b) first observed this homology between vision and language as to a content/structure distinction. These papers also present an expanded form of the linguistic demonstration synopsized below.