Chapter 7
Experiencer Predicates and Theory of Mind

7.1. Agenda

This chapter develops an analysis of two further important classes of psychological predicates – the perception verbs such as see and feel and the evaluative predicates such as interesting and bored. Three important issues are addressed in the course of the analysis. First, embedded in the perception verbs is a dividing line between those that imply a Theory of Mind and those that do not. The former class treats perception in terms of the experience of the perceiver; see is the prototypical instance of this class. The latter class treats perception in terms of observable exploration of the environment; look is the prototypical instance. However, there is a lot of fluidity between the two classes, with many verbs such as feel serving in both. The moral is that it is likely impossible to isolate Theory of Mind as a distinct module in the sense of Fodor 1983, or even in the less strict sense of Jackendoff 2002. Rather Theory of Mind consists of a collection of predicates deeply integrated into the system of conceptual structure.

The second important issue involves the interpretation of evaluative predicates. A good illustration comes from a rhetorical strategy all too familiar in academic circles: An authority figure utters something like (1),

(1) Problem P isn’t interesting.

and everyone who works on problem P feels stupid and/or insulted, without quite knowing why. In contrast, the rhetorical effect is considerably blunted if the person in question instead utters something like (2a) or (2b).

(2) a. Problem P doesn’t interest me.
    b. I’m not interested in problem P.

Intuitively, the difference is that in (2), the interest is presented as subjective, in the mind of the observer; whereas in (1), being interesting (or not) is presented as an objective or perspective-free property of the problem, like the size of a table, on which it would be silly to disagree. Thus (1) carries a subtext of asserting power over the truth, rather than leaving room for differences of opinion. The curious thing, of course, is that interest cannot inhere in a problem: it takes a person to be interested. So the problem is: how does the conceptual system come to treat interest as an objective property of objects, and what is the difference between objective and subjective in this system of predicates? As it turns out, the same issue arises with the perception predicates: for instance, in the sentence You look marvelous, the verb is used as though the way one looks is objective, rather than depending on the eye of the observer.
The issue addressed in this chapter that is probably of most interest to linguists, though, is how psychological predicates map to syntactic structure. A longstanding puzzle is why, although the pairs of sentences in (3) and (4) are nearly synonymous, their subjects and objects are reversed.

(3)  
   a. John fears sincerity.  
   b. Sincerity frightens John.

(4)  
   a. John regards sincerity as dangerous.  
   b. Sincerity strikes John as dangerous.

As pointed out by Carter 1976, such pairs do not exist in most of the vocabulary. For instance, there are no verbs like *benter, *shmeat, or *krill, forming synonymous pairs like those in (5)-(7); and this seems crosslinguistically to be the case.

(5)  
   a. John entered the room. =  
   b. The room *bentered John.

(6)  
   a. John is eating the apple. =  
   b. The apple is *shmeating John.

(7)  
   a. Fred killed the fish. =  
   b. The fish *krilled Fred.

We will discuss what it is about the semantics of psychological predicates that makes such pairs as (3)-(4) possible. This emerges first in the context of the perception verbs and then is extended in the treatment of the evaluative predicates.

7.2. Actors and Patients/Undergoers

A central part of the analysis involves elaborating the macrorole tier of conceptual structure (aka action tier in Jackendoff 1990), mentioned in chapter 6 in connection with Actors. In order to work out this elaboration, it is first necessary to supply some background about what the action tier is.

The motivation for the macrorole tier comes from considering not only the role Actor (the character doing the action), stressed in chapter 6, but also the role Patient (the character affected by the action – another term is Undergoer). Partly repeating the discussion of section 6.6, these roles are to some degree independent of the standard roles theme, agent, goal, and so forth. For instance, in (8a), *Bill is the initiator of action and therefore agent; the ball is in motion and therefore theme. At the same time, *Bill is Actor, as seen from the standard test in (8b); and the ball is Patient, as seen from the standard test in (8c). The combination of roles is thus as shown in (8d).
(8)  a. Bill threw the ball.
    agent          theme
b. What Bill did was throw the ball.
c. What happened to the ball was Bill threw it.
d. Actor = agent; Patient = theme

(9a) presents a different configuration. *The car* is in motion and therefore theme; *the tree* is the endpoint of motion and therefore goal. The tests for Actor and Patient reveal two different construals: (9b-d) and (9e-f). (9d) pairs Actor with theme, in contrast with (8d) and (9f), which pair Patient with theme.¹

(9)  a. The car hit the tree.
    theme          goal
Construal 1:
b. What the car did was hit the tree.
c. What happened to the tree was the car hit it.
d. Actor = theme; Patient = goal
Construal 2:
e. What happened to the car was it hit the tree.
f. Patient = theme

Another standard observation concerns argument structure alternations such as (10a,b). In both cases, the books are moving onto the truck, so *the books* is theme and *the truck* is goal.

(10) a. Bill loaded the books onto the truck.
b. Bill loaded the truck with the books.

But the two differ in how naturally the two phrases can be construed as Patient:

(11) a. (from (10a)):
    i. What happened to the books is Bill loaded them onto the truck.
    ii. ? What happened to the truck is Bill loaded the books onto it.
b. (from (10b)):
    i. ? What happened to the books is Bill loaded the truck with them.
    ii. What happened to the truck is Bill loaded it with the books.

This corresponds to the standard intuition that the direct object is the entity “affected” by the

¹(9) also illustrates a point made in chapter 6: Actors need not be animate, much less volitional.
action. However, this is not a necessary property of direct object position. For instance, the objects in the following sentences are not Patients (even though the sentences denote actions):

(12) a. Bill entered the room.
   cf. *What happened to the room was Bill entered it.
 b. The doctor underwent an operation.
   cf. *What happened to the operation was the doctor underwent it.
 c. Andy uttered the answer.
   cf. *What happened to the answer was Andy uttered it.

Finally, some intransitive verbs favor Actor subjects (13a), and a few favor Patient subjects (13b).

(13) a. Bill strutted/jogged out of the room.
   What Bill did was strut/jog out of the room. (Actor)
   * What happened to Bill was he strutted/jogged out of the room. (*Patient)
 b. Bill died/get sick.
   * What Bill did was die/get sick. (*Actor)
   What happened to Bill was he died/get sick. (Patient)

But many intransitive verbs whose subjects are theme are indifferent as to whether their subjects are Actors or Patients, the latter construal emerging more prominently when the subject is inanimate.

(14) a. The ball rolled down the hill.
   What the ball did was roll down the hill. (Actor)
   What happened to the ball was it rolled down the hill. (Patient)

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2For an account of why (10b) is completive (the truck ends up loaded) but (10a) need not be, see Jackendoff (1996a), which includes discussion of other popular proposals such as Tenny 1994. In particular, examples like (12) make it impossible to identify direct object position with "affectedness", a central aspect of Tenny's position.

3The term "Undergoer" is sometimes used for the Patient in intransitive sentences like (13b) and (14). Van Valin and LaPolla 1998 use Undergoer systematically instead of Patient.

4Many of these verbs are what recent tradition has called "unaccusative". My inclination is to treat them as syntactically intransitive verbs like any other, just semantically special in their macrorole tier. But the amount of literature on their special syntactic properties (e.g. Levin and Rappaport Hovav 1995 and references therein) is beyond the scope of evaluation in the present study.
b. The chocolate melted.
   What the chocolate did was melt. (Actor)
   What happened to the chocolate was it melted. (Patient)
c. The car broke down.
   What the car did was break down. (Actor)
   What happened to the car was it broke down. (Patient)

On the basis of these sorts of observations, Jackendoff (1990) proposes a conceptual function $X \textit{AFF} Y$, roughly ‘$X$ acts on/affects $Y$’, whose arguments are Actor and Patient respectively. It allows three configurations: both Actor and Patient, or either role alone. This function coexists with the standard expressions of thematic roles. (15) shows representative structures for some of the sentences above; the arguments of $\textit{AFF}$ are the macroroles.

(15)

a. Bill threw the ball =
   \[
   \begin{array}{c}
   \text{BILL CAUSE [BALL MOVE]} \\
   \text{BILL AFF* BALL}
   \end{array}
   \]

b. The car hit the tree =
   \[
   \begin{array}{c}
   \text{CAR MOVE TO CONTACT WITH TREE} \\
   \text{CAR AFF* TREE}
   \end{array}
   \]

c. Bill loaded the truck with the books =
   \[
   \begin{array}{c}
   \text{BILL CAUSE [BOOKS MOVE ONTO TRUCK]} \\
   \text{BILL AFF* TRUCK}
   \end{array}
   \]

d. Bill entered the room =
   \[
   \begin{array}{c}
   \text{BILL GO INTO ROOM} \\
   \text{BILL AFF*}
   \end{array}
   \]
   [no Patient]

e. Bill died =
   \[
   \begin{array}{c}
   \text{BILL DIE} \\
   \text{AFF* BILL}
   \end{array}
   \]
   [no Actor]

f. The chocolate melted =
   \[
   \begin{array}{c}
   \text{CHOCOLATE BECOME LIQUID} \\
   \text{CHOCOLATE AFF*}
   \end{array}
   \]
   (or AFF* CHOCOLATE)

One feature of these structures bears mention, because we will be making use of it later. Note that in (15a) and (15c), the direct object has the Patient role on the macrorole tier. However, it is not an argument of the main function CAUSE on the thematic tier; rather it is an argument of the Effect. Thus what is caused in (15c) is that the books go on the truck, but Bill’s action is conceptualized as being directed at the truck. This illustrates a virtue of the division into tiers: it allows conceptual structure simultaneously to express the overall effects of an action as well as the particular character at whom the action is directed.

The reason for the minus sign superscripted to $\textit{AFF}$ in (15) is that there is a variant of the Patient role with somewhat parallel properties: Beneficiary. Whereas someone does something to a Patient, one does something for a Beneficiary. The contrast is clear in minimal pairs like (16a,b). In (16c) the difference between Patient and Beneficiary is a pragmatic one, depending on whether meeting George is construed as a Good Thing or a Bad Thing.
Dowty 1991 argues that the traditional semantic notion of agency actually has a number of subcomponents which can appear independently, and which contribute independently to the likelihood that an NP will appear in subject position. His list of components in what he calls 'Proto-Agency' consists of the factors in (i) (Dowty 1991, 572).

(i)  
- a. Volitional involvement in the event or state  
- b. Sentience (and/or perception)  
- c. Causing an event or change of state in another participant  
- d. Movement (relative to the position of another participant)  
- e. Exists independently of the event named by the verb

Of these, (i.e) probably has something to do with Topic, rather than agent, as Dowty notes. (i.d) picks out the role here called theme (the object whose motion or location is being specified). Because theme precedes location in the linking hierarchy (Jackendoff 1990, chapter 11),
among others).

(19) Linking of macroroles to syntax
   a. The first macrorole (Actor if there is one, otherwise Patient/Beneficiary) is expressed in subject position.
   b. The second macrorole, if there is one, is (canonically) expressed as the postverbal NP (indirect or direct object).
   c. Any remaining NP arguments in the syntax (e.g. the direct objects of enter and receive) are linked to roles in the thematic tier.

There are also auxiliary interface principles that connect Patient and Beneficiary roles to syntactic positions. Two prominent cases are adversative and benefactive adjuncts, shown in (20).

(20) a. Adversative adjunct: My car broke down on me.
    b. Benefactive adjunct: Amy fed the cats for me.

This ought to be enough to give an idea of the composition of the macrorole tier. Although the arguments are clear enough, I have always been somewhat uneasy with the analysis, in that the macrorole tier contains only one possible function, AFF, in its positive and negative variants. To pull its theoretical weight, the tier should allow more varied possibilities for content. The next section develops a direction that appears promising.

7.3. Experiencers and Stimuli

7.3.1. Perception verbs and Theory of Mind. Informal discussions of lexical semantics always include the roles Experiencer and Stimulus. In traditions in which semantic roles are simply named without analysis, this is fine; but in Conceptual Semantics, individuals get their semantic roles by virtue of occupying particular argument positions of semantic functions. For example, as illustrated in section 6.1, agent is the first argument of CAUSE, effect is the second argument of CAUSE, theme is the first argument of GO or BE; and now Actor is the first argument of AFF, and Patient is the second argument of AFF. In order to provide a similar account of Experiencer and Stimulus, I would like to experiment with introducing a new macrorole tier function X EXP Y, ‘X experiences Y’, in which the first argument is Experiencer and the second is Stimulus.

themehood creates a pressure toward subjecthood if there is no agent. (i.c) is the first argument of CAUSE (what we are calling here "agent"). The attribution of sentience (i.b) appears when the character in question holds a situational or actional attitude in the sense of chapter 6 (we will call the case of situational attitudes into question in section 7.3). Volitional involvement (i.a) is a subcase of holding an actional attitude. Dowty does not say how these factors are encoded in semantic structure; we have seen here that the relevant cases are all encoded in terms of structural positions as arguments of particular functions in conceptual structure. Thus his account falls out of the present one rather nicely.
Let’s start with perception verbs. A question that has bothered me for a long time is how to differentiate *look* and *see*. *Look at* denotes an action (usually volitional but not necessarily), but *see* is not an action. So the subject of *look at* is an Actor, but that of *see* is not (21a); and *look at* can occur in progressive, characteristic of actions, whereas *see* cannot (21b) (barring certain special pragmatic situations such as *I must be seeing things*).

(21) a. What I did was look at/*see the tree.
   b. I am looking at/*seeing the tree.

Yet the thematic roles appear to be the same: I am making visual contact with the tree. The macrorole tier offers an option. Suppose that the thematic tier of both verbs has the function $X$ *SENSE*$_{visual}$ $Y$, ‘$X$ senses $Y$ in the visual modality’, which captures their commonality. Then *look at* could have *AFF* in the macrorole tier, and *see* could have *EXP*, as in (22).

(22) a. $X$ looks at $Y =$
   \[
   [X \text{ SENSE}_{visual} Y] \\
   [X \text{ AFF}]
   \]

   b. $X$ sees $Y =$
   \[
   [X \text{ SENSE}_{visual} Y] \\
   [X \text{ EXP } Y]
   \]

At least four differences arise from this distinction.

- *EXP* makes the sentence stative, as seen in (21b): the sentence is describing an experience rather than an activity. By contrast, *AFF* makes the sentence a standard activity.
- One can *look around* without looking at anything in particular. That is, *look* does not require a second argument. By contrast, one cannot *see* without seeing something, that is, *see* does require a second argument. (Even in the intransitive sentence *I can see*, the implication is that I can see *something*.)
- Even when one is looking at something, it is not a Patient: *What happened to the tree was Bill looked at it*. This difference is reflected in the macrorole tier, where *AFF* does not mark $Y$ as a Patient but *EXP* does mark $Y$ as a Stimulus.
- *EXP* allows the possibility of error or misdescription on the part of the Experiencer, for instance *In the perception experiment, Sam saw three dots, even though there were only two*. This possibility is unavailable with *look*: *Sam looked at three dots, even though there were only two*. This last difference marks *see* as another mental verb like *believe* and *intend* (section 6.4).

The posited distinction between *look* and *see* would of course be appropriate for *listen to* and *hear*, just by changing the modality of *SENSE* to *auditory*. More interesting are *taste, smell*, and *feel*, which have variants of both sorts. Active tasting, smelling (i.e. sniffing), and feeling (i.e. palpating) have *AFF* in the macrorole tier; and passive tasting, smelling, and feeling have *EXP*.

(23) a. Sam is carefully feeling the rug (for defects) =
   \[
   [\text{SAM SENSE}_{tactile} \text{ RUG}] \\
   [\text{SAM AFF}]
   \]
b. Sam feels the rug (under his feet) =

\[
\begin{array}{c}
\text{SAM SENSE}_{\text{tactile}} \text{ RUG} \\
\text{SAM EXP RUG}
\end{array}
\]

The verbs *sense* and *notice* (= ‘come to sense’) and the adjective *aware of* also express the function *SENSE*, leaving the modality open.

### 7.3.2. Important digression: AFF, EXP, and Theory of Mind

The distinction between *AFF* and *EXP* is important for another, nonlinguistic reason as well. Recall the discussion of the function *COM* in chapter 6, which lies behind both believing and intending. There I proposed that *COM* is a conceptualization of a valuation feature in experience (in the sense of chapter 2), the sense of being committed to the reality of a percept or image or to the truth of a proposition. The combination of *SENSE+EXP* also has a clear counterpart in the character of experience, namely the sense of experiencing a percept rather than an image. This is encoded as the valuation features \([+\text{external}; \neg \text{self-initiated}]\). In particular, the subscript on *SENSE* picks out which “vertical” modality contributes the percept in question.

One of the questions discussed in the Theory of Mind literature is whether chimpanzees have a Theory of Mind. Experiments have shown (Tomasello xxx, Povinelli 2000) that chimps follow the gaze of others; but there is some dispute about whether they can connect someone’s direction of gaze to his state of knowledge. The dispute is usually phrased in in terms of whether chimps understand that “seeing is knowing”. But what we have just done suggests a more accurate way to phrase the question: it is whether chimps understand that “looking is seeing”. Under the analysis just proposed, to look at something is to direct one’s gaze to it – an action observable by others – which chimps do appreciate. To *see* something, on the other hand, is to experience it visually – an unobservable state. So the dispute about chimps’ capabilities translates directly into the question of whether chimps can attribute visual experience to others – formally, whether they have the function *EXP* in their conceptual repertoire.

In other words, the function *EXP*, like the function *COM* of the previous chapter, is one of the predicates that plays a role in Theory of Mind. As with *COM* and the other attitudes, lacking the function *EXP* in one’s repertoire would not preclude one’s *having* perceptual experiences. But it would preclude one’s attributing experiences to others, and it would preclude *thinking* or *reasoning* about one’s own experiences – which is precisely what Theory of Mind is supposed to be about.

For humans, of course, the natural assumption is that if someone is looking at something, they are visually experiencing it – and vice versa. However, we also recognize exceptions. On the one hand, one can look at something without actually seeing it; on the other hand, one can have visual hallucinations without looking at anything. Thus we can write a rule of defeasible inference along the lines of (24) (the notation \(<\approx>\) stands for defeasible mutual inference).
This is the rule of “looking is seeing”; if chimps lack it, it’s because they lack the right-hand expression altogether.

According to this analysis, it does not make a lot of sense to think of Theory of Mind as “modular” in any sense remotely close to the way the term “module” is commonly used in the literature. Rather, Theory of Mind arises simply from having additional predicates such as COM and EXP in the level of conceptual structure – new ways of construing experience. In particular, EXP is so tightly integrated into the inner workings of the formalism that it is pointless to think of it as “informationally encapsulated” after the fashion of Fodorian modules (Fodor 1983) or my own “structure-constrained” modules (Jackendoff 2002, chapter 7). It’s just an extra “gimmick” in the existing module of conceptual structure that permits a whole new range of concepts and inferences to be constructed.

7.3.3. The mapping of EXP to syntax. Back to the trenches. Let’s next examine another syntactic frame of look, taste, smell, and feel, shown in (25a); the auditory counterpart is the verb sound (rather than listen or hear), as in (25b).

(25) a. That looks/tastes/smells/feels wonderful to Sam.
    b. That sounds wonderful to Sam.

These present two problems: What is the macrorole tier, and what is the thematic tier? Taking them in order: These sentences are all stative, so the macrorole tier should contain EXP, as in (26). However, the relation of (26) to the syntax is curious, in that the order of Experiencer and Stimulus is opposite to their order in (22) and (23). We put this problem off for a moment.

(26) SAM EXP THAT

Next, what is the thematic tier? The sentences attribute wonderful to that, at least in Sam’s mind, so we need something along the lines of (27a) as part of the structure. However, (27a) combined with the macrorole tier (26) is not enough, as it does not specify the perceptual modality that distinguishes each of the verbs in (25) from the others. Given that these verbs are our perception verbs again, it would be nice if we could reuse the function SENSE in this frame. So let us tentatively adopt the structure (27b), in which what Sam senses is the attribution of wonderfulness to that, and in which the macrorole tier is (26).

(27) a. THAT BE WONDERFUL
    b. That looks/sounds/etc. wonderful to Sam =
       [SAM SENSEvisual/auditory/etc. [THAT BE WONDERFUL]]
       [SAM EXP THAT]
The difference between (25) and (28) was observed by Chomsky 1970 as part of his attack on deriving (25) from the underlying syntactic structure of (28).

Understanding the structure in (27b) calls for some care. Notice first that these sentences share the subjective characteristic of other EXP sentences, in that Sam’s judgment may be nonveridical: we can easily say That looks wonderful to Sam, but it’s really not. Second, notice that unlike (22)-(23), the second argument of EXP is not identical with the second argument of SENSE. Recall the parallel situation with action verbs in examples such as Bill loaded the truck with books (15c): the caused action is that the books go on the truck, but the Patient is just the truck. Similarly, in (27c), Sam senses the whole situation but experiences it in terms of a particular object. We return to some further cases like this below.

Next, we must be especially careful to distinguish (25) from (28), which means something different. In turn, (28a) and (28b) are not entirely parallel, as shown by the continuations: see must be veridical in this context but hear and feel need not be.

(28) a. Sam sees that that is wonderful ( – *but he’s wrong).
    b. Sam hears/feels that that is wonderful (– but he’s wrong).

The tensed that-clauses suggest that (28a,b) are expressions of propositional attitude: Sam has an experiential relation to the truth of a proposition that describes a situation. By contrast, (25) expresses a direct experience of a situation, unmediated by a proposition. In addition, because that is buried in the subordinate clause in (28), it does not function as Stimulus, as it does in (25).

A closer paraphrase to (25) uses the verb find, which puts Sam in subject position but leaves open the modality of experience; this too can be nonveridical. It leaves the modality of SENSE open.

(29) Sam finds that wonderful (– but it’s not).
   = [SAM SENSE [THAT BE WONDERFUL] ]
    [SAM EXP THAT]

But now we come face to face with the problem of mapping of the macrorole tier into syntax. A very close paraphrase to (29) is (30), which has the Experiencer and Stimulus in opposite syntactic positions. (31a,b) are another well-known minimal pair, both very close in meaning to (29) and (30).

(30) That seems wonderful to Sam.
(31) a. Sam regards that as wonderful.
    b. That strikes Sam as wonderful.

The verbs regard and strike are representative of a sizable class of predicates whose syntactic properties have been discussed in the literature for years, dating back at least to

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6The difference between (25) and (28) was observed by Chomsky 1970 as part of his attack on deriving (25) from the underlying syntactic structure of (28).
Chomsky 1965. Chomsky notes that pairs such as (31) are similar in meaning, in particular that both involve *Sam* in the role (now called) Experiencer and *that* in the role Stimulus, but in opposite grammatical positions. This is a serious problem because it contradicts one of the deepest assumptions of generative grammar, dating back to the earliest work: that underlying syntactic form reflects semantics, especially thematic roles, uniformly.\(^7\) Section 7.1 offered a standard argument for this position: there are no verbs that reverse the arguments of *enter, eat,* and *kill.* Pairs like (29)-(31) appear to be a counterexample to this fundamental position.

There have been two basic approaches to the problem. Both accept the standard assumption about the relation of underlying syntactic form and thematic roles. The first accepts that (31a,b) are synonymous, and derives them both from a common underlying form. For example, Lakoff 1965/1970 and Postal 1971 propose that the pattern in (31b) is derived transformationally from an underlying form with the phrasal order of (31a). Postal in particular seeks to explain certain odd characteristics of the (31b) pattern on the basis of its having undergone this derivation. A similar approach is developed by Belletti and Rizzi (1988). However, so far as I know, there is never any explanation of why particular lexical items, all with a particular kind of meaning, undergo this sort of derivation.

The second approach to these alternations (e.g. Grimshaw 1990 and Pesetsky 1995, whose proposal will be discussed further in section 7.4) claim that (31a,b) are *different* in meaning, i.e. either *Sam* or *that* has different thematic roles in the two sentences. From this difference in thematic roles comes a different linking to syntax. But because these proposals do not include an articulated theory of semantic structure, their claims cannot be adequately evaluated. It is all too easy to convince oneself of a delicate difference in meaning and, without formalizing it, talk oneself into it for the sake of its efficacy in deriving the syntax. The argument risks circularity: the theory predicts that there is a difference in meaning, so you go out and find one, no matter how shaky.

I am going to take a third tack here and claim that (31a,b) are indeed synonymous, apart from constructional aspects of meaning that apply to subject position, for example that subjects are more likely to be topics. But I will not derive one from the other syntactically. I will instead attribute the difference in syntactic structure to a different linking between semantics and syntax. The idea is this: in the case of action sentences there is a strong canonical mapping between macroroles and syntax, as laid out in (19) in the previous section. In particular, the Actor has a very strong claim on syntactic prominence and hence always grabs the subject position. On the other hand, the Experiencer-Stimulus dyad is less stable in terms of prominence, so there is no

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\(^7\)This function of underlying syntactic structure was weakened in mainstream generative grammar in the late 1960s, but was reasserted as UTAH (Baker 1988) in the middle 1980s and as a property of LF at about the same time. See Culicover and Jackendoff forthcoming, chapter 2.
Such an instability might arise from a conflict between two factors involved in weighting for syntactic prominence (along the lines of Dowty’s (1991) feature analysis of the macroroles). One factor is which character is having an effect on which: the Actor is having an effect on the Patient, and the Stimulus is having an effect on the Experiencer. The other factor is (prototypical) animacy: the prototypical Actor is a volitional Actor, hence animate; the Experiencer is always animate. In the Actor-Patient dyad, these two factors strongly converge in favor of the Actor; in the Experiencer-Stimulus dyad they are in conflict.

Consequently, each verb that has EXP in its meaning must individually specify which macrorole is mapped to subject. If we notate the macrorole destined to be syntactically prominent by underlining, we can show the difference between find and seem as follows:

(31) a. Sam finds that wonderful = [SAM SENSE [THAT BE WONDERFUL] ]  
                   [SAM EXP THAT]  
                   (also Sam regards that as wonderful)

                b. That seems wonderful to Sam = [SAM SENSE [THAT BE WONDERFUL] ]  
                   [SAM EXP THAT]  
                   (also That strikes Sam as wonderful)

There are some grammatical reflections of this instability, especially in the paradigm with Stimulus subject. Postal 1971 notes that reflexives in object position with (at least some of) the Stimulus-subject verbs are odd (32a,b), whereas parallel Experiencer-subject verbs (32c) and Action verbs (32d) allow reflexives without difficulty.

(32) a. Sam strikes/impresses himself as pompous
    b. Sam smells funny to himself.
    c. Sam regards himself as pompous. [Experiencer subject]
    d. Sam smelled himself to see if he needed a shower. [Action: AFF rather than EXP]

Stimulus-subject verbs are also ungrammatical in the passive (33a), whereas parallel Experiencer-subject verbs allow passive (33b,c).

(33) a. *Harry is struck/impressed by Sam as pompous.
    b. Harry is regarded by Sam as pompous.
    c. Harry is often found pompous (by uninformed people).

The instability of the Stimulus-subject configuration also shows up in aphasia. It is well known that agrammatic aphasics have difficulty interpreting passives like The lion was chased by the tiger, getting the characters in the right roles only at chance levels. Piñango 2000 shows that the same difficulty shows up in Stimulus-subject sentences like The boy pleases the girl – though not in Experiencer-subject sentences such as The girl likes the boy.

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8Such an instability might arise from a conflict between two factors involved in weighting for syntactic prominence (along the lines of Dowty’s (1991) feature analysis of the macroroles).
But Experiencer-subject verbs are not without their odd symptoms either: crosslinguistically they often appear with dative subjects and even nominative objects (as in Icelandic (Maling xxxx)). And, as will be seen in Table 7.1 below, even in English there are considerably fewer Experiencer-subject verbs than Stimulus-subject verbs. So both classes of Experiencer verbs are rather curious. I will not offer an account here of these oddities, but I will take them as an indication that the grammar is a bit uncomfortable about the mapping of EXP into syntax; things don’t go exactly the way they ideally should.

Just to see the intricacy of lexical relations that can be generated by this little system, it’s worth reviewing the readings of look and see.

(34) Phonology/syntax: NP see NP   NP look at NP   NP look AP to NP
      Semantics: [X SENSE\textsuperscript{visual} Y] [X SENSE\textsuperscript{visual} Y] [X SENSE\textsuperscript{visual} [Y BE Z]]
            X EXP Y X AFF X EXP Y

We can also add two senses of appear, one active and one like the experiential sense of look:

(35) a. God appeared to Moses (active) = [MOSES SENSE\textsuperscript{visual} GOD ]
       GOD AFF (MOSES)

   b. God appeared immense to Moses = [MOSES SENSE\textsuperscript{visual} [GOD BE IMMENSE] ]
       MOSES EXP GOD

Some further complexities in this paradigm, having to do with the traditional distinction between “raising” and “control”, appear in the appendix to this chapter, section 7.6.

It is worth stressing how the solution proposed here for (29)-(31) goes against the grain of standard thinking in linguistic theory. The trend over the past thirty years has been to relieve individual verbs of the responsibility for determining the positions of their syntactic arguments, by proposing linking hierarchies along the lines of (19). Accepting a linking hierarchy as a linguistic universal\(^9\) entails that when we come up against apparent counterexamples such as find/seem or regard/strike, we have to find a semantic difference to account for the syntactic difference. The alternative proposed here is that this is not a universal of language; it pertains only to verbs expressing AFF – which were after all the verbs used to motivate the original argument. The psychological predicates expressing EXP, on this view, are genuine counterexamples to the linking universals, and children do have to learn them one by one. Fortunately, they are learnable, given that children actually hear the relevant sentences that show them the right order of arguments. So in terms of learning, the position proposed here isn’t such a big deal.

7.3.4. Experiencer verbs without overt Experiencers. Next consider a minor syntactic variant on (25), in which no Experiencer is expressed:

\(^9\)Or alternatively, multiple linking hierarchies from which individual languages can choose in various ways (Aissen 1999).
(36) a. Pat looks/appears/sounds/feels/seems wonderful.
   b. The stew tastes/smells wonderful.

What semantic structure should be assigned to (36)? In particular, it would be desirable to keep SENSE as the function on the thematic tier, so that the differences of modality stay the same as in (25). However, we then require an Experiencer to fill the first argument of SENSE.

Who is the Experiencer, though? There are two possibilities. First, the speaker can be taken to be the implicit Experiencer, that is, the context can fill in I, to yield a structure parallel to (31b). But the Experiencer is not always understood to be the speaker. Consider I heard from Joan that Pat looks wonderful. Here the Experiencer might be Joan, or she might have heard it in turn from someone else. It seems to me that this sense conveys the effect of the stimulus on a nonspecific, generic observer. Such an individual can be expressed (in subject position) by the generic personal pronoun man in German and on in French, and sometimes by English one, people, and unstressed you (or “ya”, e.g. Ya never see bubblegum commercials on TV any more). I’ll use the term YA in conceptual structure to stand for such a generic individual. Following this line of reasoning, we get (37) as the thematic tier of (36) on the generic reading.

(37) Pat looks wonderful = YA SENSE_visual [PAT BE WONDERFUL]

Sentences with generic characters in them express generic situations. For instance, People go to the movies on Saturday night expresses not a particular event of someone going to the movies, but a generic event, in which the movies is not a particular movie and even Saturday night is not a particular Saturday night. On the other hand, a generic is subtly different from a universal quantification such as Every person goes to the movies on Saturday night. The generic is somehow less specific, less compulsive, more forgiving than universal quantification; it seems to convey a characteristic situation rather than an exhaustive person-by-person enumeration.

The same generic sense appears in (37). It’s not as though, if you check every person, all of them find Pat to look wonderful, as in Every person finds Pat to look wonderful; rather the judgment is characteristic or typical of how people would find Pat to look. As a result, the wonderfulness comes to be a characteristic of Pat rather than a relation between Pat and some particular perceiver.

This use of “YA” as an implicit argument is not confined to psychological predicates. Consider the relation between Sam is polite to his friends and Sam is polite. One cannot be polite in the absence of social contact: politeness inherently requires other individuals to whom one is being polite. Therefore Sam is polite must have an implicit argument; but this argument is more general than in Sam is polite to someone, and less specific than in Sam is polite to everyone. Rather, that the appropriate implicit argument seems again to be the generic person “YA”: ‘Sam is polite to people in general’.

Now let us think about the macrorole tier for (36). Since no Experiencer role is expressed,
it might make sense to just omit this role from the macrorole tier. Such an analysis would parallel sentences with Patients but no Actors, e.g. (15e,f): Bill died; The chocolate melted. The result is a structure like (38).

(38) Pat looks wonderful = [YA SENSE_{visual/auditory} [PAT BE WONDERFUL]]
EXP PAT

An alternative reading with the same syntax appears with the verb feel, as in for instance Pat feels wonderful. On one reading someone else feels Pat; this has a structure just like (38) but in the tactile modality. The other reading expresses Pat’s own feelings, irrespective of modality (e.g. I feel pretty!). This comes out like (39), with no Stimulus picked out in the macrorole tier.

(39) Pat feels wonderful = [PAT SENSE [PAT BE WONDERFUL]]
PAT EXP

So again we see how a different subtly related senses of words are generated by manipulating a small number of parameters in semantic structure. We get four different senses of feel – active palpation (23b), passive tactile sensation (23a), generic report of tactile properties (38), and internal sensation of properties (39) – out of combinations of the same primitive functions.

An important aspect of (38) is that intuitively it presents itself as “observer-free” or “perspective-free” – it is not tied to any particular Experiencer. If I utter (38), I’m not telling you who saw Pat and made a judgment. This is captured in the formalism by the use of YA as the first argument of SENSE and the absence of an Experiencer role with EXP.10 The result is that (38) conveys a sense of being dispassionate or objective. What is curious about this is that the semantic structure of the sentence makes essential use of EXP, the quintessential Theory of Mind predicate; but at the same time the judgment is taken out of people’s minds! This parallels closely the puzzle about example (1) in the introduction: How can That problem isn’t interesting be an objective, observer-free property of the problem? Interesting is one of the predicates that is we now address.

7.4. Evaluative predicates

7.4.1. Classes of evaluative psychological predicates. The point at which we have just arrived with the perception verbs parallels our initial puzzle with example (1) in the introduction, That problem isn’t interesting. How can interesting be presented as an objective, observer-free property of a problem, when interest requires an interested person?

In order to tackle this problem in a suitably general way, I want to look at the huge and

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10One can imagine notating this with other combinations, such as YA also in the macrorole tier or no argument for the Experiencer in the thematic tier. I’m not sure what difference that would make, and for moment I’m exploring the possibility that strikes me as most interesting.
varied class of evaluative terms of which *interesting* is a member. It is important to examine the enormous mass of linguistic detail, in an effort to tease apart what is systematic in the semantics from what is only partially systematic in the morphology.

There are six different grammatical forms of interest, which overlap morphologically with respect to what stems appear in them. In (40) they are arranged along a pragmatic cline, beginning with the form that most emphasizes the Experiencer and ending with the one that most emphasizes the Stimulus. Each stem has only a partial selection of the forms, so I illustrate both with *bore* and *detest* in order to fill out the paradigm.

(40) a. I'm bored. [Experiencer-Adjective]
b. I'm bored with this. [Experiencer-Adjective-Stimulus]
c. I detest this. [Experiencer-Verb-Stimulus]
d. This bores me. [Stimulus-Verb-Experiencer]
e. This is boring to me. This is detestable to me. [Stimulus-Adjective-Experiencer]
f. This is boring. This is detestable. [Stimulus-Adjective]

Table 7.1 (pages 7-18 to 7-21) enumerates a large selection of such predicates, arranged by what forms they appear in. A number of observations emerge from examining these data.

- The adjectives in frame (40b) differ in their choice of preposition, which is largely lexically idiosyncratic: *bored with this*, *apprehensive about this*, *amazed at this*, and so on. There may be some degree of semantic motivation behind these choices, but I will not be concerned with them here. In some cases two separate Stimulus complements are possible in this frame, e.g. *angry with Bill about the party*, *irritated at Mary about the mistake*. Pesetsky (1995, 60) distinguishes these two complements as “Target” and “Subject Matter” roles; for the moment I will not distinguish them (though not without acknowledging that something is being missed thereby).

- The adjectives in (40) are deverbal, but more generally this need not be the case. For instance, *happy*, *ecstatic*, and *nervous* appear in frames (40a,b); and *funny*, *worthless*, and *important* appear in frames (40e,f). Other patterns are possible. For instance, the adjective *calm* appears in frame (40a) and reappears as the verb *calm* in frame (40d) and the adjective *calming* in (40e,f). *Elated* appears in frames (40a,b) but there is no verb *elate* (in my dialect) from which it can be “derived”. *Apprehensive* appears in frames (40a,b) but the verb *apprehend* has a different meaning altogether. *Curious* and *sad* appear both as an Experiencer property (frames 40a,b) and a Stimulus property (frame 40f).

- For the most part, the same verb does not occur in both the Experiencer-Verb-Stimulus frame (40c) and the Stimulus-Verb-Experiencer frame (40d). But Pesetsky 1995 points out a number of verbs that do:
(41) a. I worry about this. vs. This worries me.
b. I’ve puzzled over this. vs. This puzzles me.
c. I delight in this. vs. This delights me.
d. I grieve over this. vs. This grieves me.

• If a verb $V$ occurs in the Stimulus-Verb-Experiencer frame (40d), it usually has a related Experiencer adjective $V$-ed (frames 40a and/or 40b) and a related Stimulus adjective $V$-ing (frames 40e,f). $Bore$ is a typical example; others are $amaze$, $amuse$, $interest$, and $please$. However, some such verbs have adjectival derivatives with other affixes, e.g. $anger/angry/[no$ Stimulus$ adjective]$, $attract/attracted/attractive$, $disgrace/disgraced/disgraceful$, $endanger/endangered/dangerous$, $impress/impressed/impressive$, $nauseate/nauseous/nauseated/nauseating$, $offend/offended/offensive$, $scare/scared/scary$. And other verbs, such as $bug$ ($This$ problem $bugs$ me) have no related adjectives.

• Many verbs that occur in the Experiencer-Verb-Stimulus frame (40c) have related Stimulus adjectives (frames 40e,f), e.g. $abhor/abhorrent$, $detest/detestable$, $enjoy/enjoyable$, $like/likeable$, $loathe/loathsome$, $value/valueable$. But most such verbs lack related Experiencer adjectives (frames 40a,b) (though there is $fear/fearful/?fearsome$).

In short, we have the usual mix of semiregularity and irregularity characteristic of derivational morphology.

(Text continues on p. 7-21)

| Table 7.1. Psychological verbs and adjectives and their morphological variants |
|---|---|---|---|---|
| I'm bored | I'm bored with this | abhor | abhorrent | abhorrent |
| afraid | afraid of/about | amaze | amazing | amazing |
| angry | amazed at/about | amuse | amusing | amusing |
| | amused at/about | anger | | |
| | annoyed at/about | annoy | annoying | annoying |
| | | appeal to | appealing | appealing |
| apprehensive | | | | |
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7-18
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Table 7.1. Psychological verbs and adjectives and their morphological variants

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<th>B. Exp-Adj-Stim I'm bored with this</th>
<th>C. Exp-Verb-Stim I detest this</th>
<th>D. Stim-Verb-Exp This bores me</th>
<th>E. Stim-Adj-Exp This is boring to me</th>
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Table 7.1. Psychological verbs and adjectives and their morphological variants

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<tr>
<td>I'm bored</td>
<td>I'm bored with this</td>
<td>I detest this</td>
<td>This bores me</td>
<td>This is boring to me</td>
<td>This is boring</td>
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Going a little more beneath the surface, there is an important division among adjectives in the Experiencer-subject frame (40a). Some, such as bored, can express pure “feelings”, as shown in (42a). But others, such as interested, always have an implicit Stimulus argument; thus (42b) is infelicitous.

(42) a. I'm not bored with anything in particular, I'm just (plain) bored.
       [also calm, depressed, distressed, elated, enraged, excited, happy, joyful, nervous, sad, scared, terrified, upset]
   b.* I'm not interested in anything in particular, I'm just (plain) interested.
       [also amazed, amused, annoyed, ashamed, disgraced, disgusted, horrified, insulted, offended, outraged, pleased, puzzled, surprised, thrilled]

The contrast between these two classes parallels that between swallow and eat:

(43) a. I didn't swallow anything, I just swallowed.
   b.* I didn't eat anything, I just ate.

Following the treatment of Jackendoff 2002 (chapter 5), swallow has one obligatory semantic argument, the Actor, and one optional semantic argument, the material swallowed. Thus one can swallow (Actor alone) without swallowing anything – the Actor can perform the action without a Patient. By contrast, eat invariably has two semantic arguments, only one of which is obligatorily expressed in syntax. Thus if one is eating, one is inevitably eating something. The same analysis can be applied to bored vs. interested, as diagrammed in (44).
The implicit argument of interested differs from that of eat in that it is definite: I’m eating is shorthand for I’m eating something, while I’m interested is shorthand for I’m interested in it/that. Definite implicit arguments also occur for instance with know and remember: I know/remember means I know/remember it/that, not I know/remember something (Grimshaw, others, Jackendoff 2002, p. xx).

7.4.2. Experiencer-subject adjectives and verbs. We now begin to formalize the frames in (40). The goal is to provide a natural account of the semantic relations among them. The morphological relations, where they exist, provide important clues, in that morphologically related items should ideally share a semantic core. We begin with the Experiencer-subject adjectives (in frames (40a,b)).

In general, adjectives express properties of the individual denoted by the subject. The standard formalization of adjectival predication within Conceptual Semantics is shown in (45). The subscripts $i$ and $j$ in (45) indicate that the semantic argument position $X$ corresponds to the syntactic subject, and the semantic argument position $Y$ corresponds to the adjective phrase. For

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11 The implicit argument of interested differs from that of eat in that it is definite: I’m eating is shorthand for I’m eating something, while I’m interested is shorthand for I’m interested in it/that. Definite implicit arguments also occur for instance with know and remember: I know/remember means I know/remember it/that, not I know/remember something (Grimshaw, others, Jackendoff 2002, p. xx).

12 This formalization differs in spirit from a more traditional logical treatment of adjectival predication, which in the present notation would come out as (i).
the time being we disregard the macrorole tier; we return to it in section 7.4.4.

(45) Phonology/Syntax:  \[ \text{NP}_i \text{ is AP}_j \]
Semantics:  \[ Y_j \text{ BE} [\text{Property } Y_j] \]

Example:  \[ \text{Sam is old} = \text{SAM BE OLD} \]

We want the adjectives under analysis here to conform to this template. Accordingly we will encode them all as properties, as in (46).\(^{13}\)

(46) a.  \[ \text{Sam is bored} = \text{SAM BE [Property BORED]} \]
b.  \[ \text{Sam is bored with school} = \text{SAM BE [Property BORED (SCHOOL)]} \]
c.  \[ \text{Sam is interested} = \text{SAM BE [Property INTERESTED (Z)]} \]
d.  \[ \text{Sam is interested in school} = \text{SAM BE [Property INTERESTED (SCHOOL)]} \]

(i) Phonology/Syntax:  \[ \text{NP}_i \text{ is AP}_j \]
Semantics:  \[ Y_j (X_i) \]
Example:  \[ \text{Sam is old} = \text{OLD (SAM)} \]

The treatment in (i) views simple adjectives as one-place predicates that happen to require a semantically empty verb \textit{be} for syntactic well-formedness. By contrast, the treatment in (45) views a simple adjective as a semantic constant that denotes a position in “property space”. On this analysis, the verb \textit{be} is contentful: it establishes the connection between the subject and the property, just as it establishes the connection between the subject and a spatial location in \textit{Sam is in Pittsburgh}. Jackendoff (1983, chapter 10) argues that the treatment in (45) more closely reflects the syntactic argument structure of adjective phrases, which can never have an internal subject. It also leads to a nice treatment of a phrase like \textit{get older}, which turns out to denote change in property space “in the direction toward OLD”; and it permits a natural analysis of complex adjective phrases such as \textit{three years older than Harry}, whose semantics comes out entirely parallel to spatial expressions such as \textit{three miles down the road from Harry}.

Readers who nevertheless favor the treatment in (i) are encouraged to translate. In particular, they will have to add to the semantic analysis of each adjective one more argument, corresponding to the subject; for example, \textit{interested in Z} will have two arguments instead of my one: \textit{Z plus the subject}.

\(^{13}\)Since these are adjectives describing mental states, one might wonder if some more mentalistic predicate than \textit{BE} might be the appropriate connector. I would contend that \textit{BE} is just right: \textit{Sam is happy} ascribes a state of happiness to Sam, just as \textit{Sam is skinny} attributes a shape to him. In fact, most of these predicates have an inner, experiential aspect and an outer, behavioral aspect. If we wish to speak about the inner aspect alone, we say \textit{Sam feels happy}. If we wish to speak about the outer aspect without a commitment to the inner aspects, we say \textit{Sam looks happy}. According to the analysis in the previous section, these both have a \textit{BE} of predication embedded under the mentalistic verb \textit{SENSE}.  

7-23
Note that (46c) has an implicit argument Z whose content is filled in by the context, whereas (46a) lacks such an argument. This follows the analysis in (44). More generally, we can divide these adjectives into two general classes of properties, which I will designate (with some hesitation) as “inherent feelings” and “directed feelings”. Thus the general form for these adjectives will be (47); the subscript on FEELING distinguishes the two classes.

(47) a. Inherent feelings (e.g. bored, calm, depressed, happy):
   \[\text{Property} \: \text{FEELING}_i \langle(Z)\rangle\] \[\text{where } \langle(Z)\rangle \text{ denotes an optional argument}\]

   b. Directed feelings (e.g. amazed, amused, interested, pleased):
   \[\text{Property} \: \text{FEELING}_d (Z)\]

These properties can fill the argument position Y in the general template (45) for adjectival predication. Informally, then, structure (46a) can be paraphrased as ‘Sam has an inherent feeling of boredom’; (46b) as ‘Sam has an inherent feeling of boredom directed toward school’; (46c) as ‘Sam has a directed feeling of interest toward something’; (46d) as ‘Sam has a directed feeling of interest toward school’.

So far the analysis takes care of frames (45a) and (45b). Next let us extend it to frame (40c): verbs such as like, loathe, and detest, which have Experiencer subjects. Intuitively, these denote a feeling on the part of the subject, directed toward the object. Because they are verbs instead of adjectives, they need no verb be. The simplest treatment of these verbs is to say that they combine a directed feeling with the predication function BE, as in (48):

(48) Verbs with Experiencer subjects (e.g. like, hate, loathe, adore):
Phonology/Syntax: \[\text{NP}_i \text{ V NP}_j \text{ or } \text{NP}_i \text{ V [PP P NP}_j]\]
Semantics: \[\text{X}_i \text{ BE } \{\text{Property} \: \text{FEELING}_d (Z_j)\}\]

Thus the meanings of these verbs conform to the standard predication template (45), but they do so in a different way than the adjectives: in addition to specifying the property, they “incorporate” the predication function BE, so there is no need for the linking verb be in syntax. (This parallels the incorporation of, for example GO and INTO into the verb enter, as discussed in section 6.1.) However, they leave open the entity of whom the property is predicated, as well as the argument of the directed feeling. Thus they end up with two open arguments, which come to be expressed as the subject and object (or oblique object) respectively of the verb. Informally, then, the analysis of Sam likes beer might be paraphrased somewhat awkwardly as ‘Sam has a feeling of liking directed toward beer’.

7.4.3. Stimulus-subject adjectives. We now move on to frame (40e), the adjectives with Stimulus subjects and an overt Experiencer. Compare (49a), where interested is a property of the Experiencer, with (49b), where interesting is a property of the Stimulus.
One might try to relate the frames in (49) in the opposite direction, taking the Stimulus properties as basic and deriving the Experiencer properties by lambda-extraction from them. I am inclined to think this is the wrong approach, for two reasons. First, it would give us no account of the inherent feelings such as bored, which do not involve any Stimulus. Second, what makes these adjectives “psychological predicates” is that they are essentially about the effect of things on observers. Thus it makes sense to take as basic the observer’s reaction – the feeling – and build the stimulus properties around this, rather than the other way around.

For a very good first approximation, the relation between Sam and golf is the same in the two sentences; the major difference is in what this relation is predicated of. A type of paraphrase common in formal logic offers an approach to the treatment of (49b): ‘Golf is such that Sam is interested in it’ – that is, (49b) contains the same relation as (49a), ‘interested in’, but it predicates over the second argument of the variable instead of the first. More formally, this is done with so-called lambda-extraction, as in (50). The notation $\lambda z$ can be read informally as ‘such that’, and the bound variable $z$ that serves as argument of INTERESTED can be read as the resumptive pronoun ‘it’.

(50) Golf is interesting to Sam =
    GOLF BE [\{Property $\lambda z$ [SAM BE INTERESTED ($z$)]\]
    ‘golf is such that Sam is interested in it’

Under this analysis, the general form for adjectives in frame (40d) is (51).

(51) Stimulus properties with overt Experiencer (e.g. amazing to X; amusing to X, boring to X, interesting to X, pleasing to X):
    [\{Property $\lambda z$ [X BE FEELING ($z$)]\}]   [where FEELING includes both i- and d-feelings]
    ‘such that X has such-and-such a feeling about it’

Frame (40f) is our original problem case, That’s not interesting. It differs from (40e) only in that it lacks an overt Experiencer. The difference entirely parallels our treatment of look/sound/seem/etc. in section 7.3.4, right down to the use of the preposition to:

(52) a. Pat looks wonderful to Steve.   [report of subjective judgment]
    b. Pat looks wonderful.           [perspective-free]
    c. Golf is interesting to Steve. [report of subjective judgment]
    d. Golf is interesting.           [perspective-free]

Thus it seems appropriate to adopt the same situation in this case: to attribute the interest to a nonspecific, generic observer, notated as $YA$ in conceptual structure. On this analysis, Golf is interesting comes out as (53a), and the general form for adjectives in frame (40f) is (53b).

\[\text{(53a) } \text{Golf is interesting} \]

\[\text{(53b)} \]

\[\text{Golf is such that } YA \text{ has such-and-such a feeling about it} \]

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\(14^\text{One might try to relate the frames in (49) in the opposite direction, taking the Stimulus properties as basic and deriving the Experiencer properties by lambda-extraction from them. I am inclined to think this is the wrong approach, for two reasons. First, it would give us no account of the inherent feelings such as bored, which do not involve any Stimulus. Second, what makes these adjectives “psychological predicates” is that they are essentially about the effect of things on observers. Thus it makes sense to take as basic the observer’s reaction – the feeling – and build the stimulus properties around this, rather than the other way around.}}\]
(53)  

a. Golf is interesting =
   GOLF BE [property λz [YA BE INTERESTED (z)]]
   ‘golf’ is such that one is/people are interested in it’

b. Stimulus properties without overt Experiencer (same adjectives as in (51) but without to λx):
   [property λz [YA BE FEELING (z)]]
   ‘such that ya/people have such-and-such a feeling about it’

7.4.4. Stimulus-subject verbs. Finally, let’s look at frame (40d), the Stimulus-subject verbs such as This interests me. There are a couple of possible analyses. The simplest would be to treat This interests me as essentially synonymous with This is interesting to me. Its structure would then have the informal paraphrase ‘This is such that I am interested in it’, and the formal structure (54a). But (54a) is formally redundant, in that the outer BE and the lambda-extraction logically cancel out. A logically equivalent formulation is the far simpler (54b), whose informal paraphrase is ‘I am interested in this’.

(49) Phonology/syntax:                NP₁ interests NP₂
   a. Semantics:                   X₁ BE λz[Y₂ BE INTERESTED (z)]
                                   ‘NP₁ is such that NP₂ is interested in it’

   b. Semantics:                   Y₂ BE INTERESTED (X₁)
                                   ‘NP₂ is interested in NP₁’

The only difference between (54a) and (54b) is that in (54a), the lambda-extraction makes the Stimulus more prominent. We might see this as the semantic correlate of placing it in subject position. Another way to achieve the same effect is to use the macrorole tier, as will be seen in the next section.

Pesetsky 1995 proposes another alternative for the meaning of Stimulus-subject verbs. On his view, these verbs are causative: This interests me means roughly ‘this causes me to be interested in it’. Such an analysis is especially plausible for some verbs in this class, for instance attract (one that Pesetsky does not cite). This verb’s spatial sense, as in The magnet attracted the iron, means roughly ‘X cause Y to move toward X’. The psychological sense has a parallel feel: This problem attracts me suggests that the problem exerts a force on me that moves me towards engaging with it. Enrage and embitter likewise seem plausible candidates, on the strength of paraphrases like ‘cause to become enraged’ and ‘cause to become bitter’.

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15Well, not quite, as can be seen from an example like The magnet attracted the filings, but they didn’t move. A more correct analysis involves not CAUSE but a variation called CS in Jackendoff (1990, chapter 7), following the analysis of “force-dynamics” in Talmy 1988. The difference between CAUSE and CS can be illustrated by the difference between Bill forced Sam to leave and Bill pressured Sam to leave. Both involve the application of force on Sam by Bill. But only in the former does Bill achieve his goal of getting Sam to leave; this is true causation, or CAUSE. In the latter case we don’t know if Sam actually left, which is CS.
On the other hand, other verbs in the class feel far less comfortable in a causative paraphrase. Think again about *interest*. By comparison with ‘cause to become enraged’, the causative paraphrase ‘cause to become interested in’ feels rather lame. To be sure, certain contexts can induce causative readings for many verbs in this class, as seen in (55a,b).

(55) a. Will tried/intended to please Harry. (≈ ‘Will tried/intended to make Harry be pleased with him’)
   b. In order to puzzle the cops, .... (≈ ‘in order to make the cops puzzled’)

But that doesn’t necessarily mean that these verbs are *always* causative. To see why not, consider stative predicates like *be quiet*. We don’t want to say that such predicates are invariably agentive: a machine or an evening can be quiet without any agent in sight. But in contexts similar to (55), e.g. *try to be quiet; in order to be quiet,*...., there is a clear sense of volitional control over behavior. This sense comes from coercion induced by *try, intend, and in order to* – in fact the very coercion we observed with *intend* in chapter 6. This suggests that the sense of agentivity in (55) is likewise a consequence of coercion. My sense therefore is that many Stimulus-subject verbs likewise have a simple stative reading in which, e.g. *This interests/pleases/worries me* is effectively synonymous with *I am interested in/pleased with/worried about this*. In fact, Pesetsky himself notices that such readings exist, in that he points out a class of noncausative Stimulus-subject verbs such as *This appeals to me; This matters to me*. In other words, the data indicate that there are both inherently causative Stimulus-subject verbs (*attract, enrage*) and inherently noncausative ones (*interest, please, appeal to*); and that the latter can be coerced into causative readings in certain contexts.

In an overtly causative sentence, the agent need not be identical with the Stimulus, as seen in (56a). On the other hand, the simple verbs *anger and worry* in (56b) do not allow the expression of a Stimulus distinct from the agent.

(56) a. The article in the paper made Sam angry at the government.
   Dan’s behavior made Barbara worry about his sanity.
   b. The article in the paper angered Sam (*at the government*).
   Dan’s behavior worried Barbara (*about his sanity*).

Pesetsky 1995 uses this observation as a departure point for a long train of reasoning that leads him to a radical reformulation of syntactic theory. However, there is no need to get on that train. Pace Pesetsky, the ungrammaticality of the final PPs in (56b) is far from a deep-seated generalization that cries out for explanation in terms of Universal Grammar. Rather, the empirical facts suggest that we are simply dealing with an issue of lexical stipulation. Pesetsky himself points out that there are plenty of verbs in this class that do allow distinct agent and Stimulus (57), often forming minimal pairs with nearly synonymous verbs that don’t (58).
(57)  a. Nancy riled Fred up about their taxes.
    b. The news got Sam down about his income.
    c. The concert turned me on to Beethoven.
    d. The article in the paper pissed Sam off at the government.
    e. Dan interested Barbara in chess.

(58)  a. Nancy irritated Fred (*about their taxes).
    b. The news depressed Sam (*about his income).
    c. The concert excited me (*about Beethoven).
    d. The article in the paper angered Sam (*at the government).

Pesetsky ends up capturing this difference with an ad hoc syntactic/morphological feature concealed deep in the machinery; it seems simpler (and more natural for the learner) to capture it with a superficial difference in syntactic subcategorization, which is the position I will take here.

Moreover, there are other variants. Sometimes in the simple transitive case, the Stimulus is understood as identical with the agent; this is certainly the case with This attracts/repels me, for instance. In other cases, the Stimulus is only defeasibly the same as the agent, as in Pesetsky’s example This article about heart disease worries me -- and not just about my own health. In still others, the verb can express causation of an inherent feeling, as in The ghost story frightened/depressed/bored me. In such cases the subject is no longer a Stimulus, but rather just an agent. So when a genuinely causative reading is possible, the status of the Stimulus varies from verb to verb.

Pesetsky, in an effort to show that the Stimulus need not be identical with the agent, cites the following two examples (his (161), pp. 57-58):

(59)  a. *John worried about Mary’s poor health, but Mary’s poor health did not worry John.
    b. (*)Mary’s poor health worried John, but John did not worry about Mary’s poor health.

He claims that (59a) is a contradiction but (59b) is not, in that Mary’s poor health may have caused John to worry about something else. I personally concur with Zubizarreta’s (1988) judgment (cited by Pesetsky (note 52, p. 300)) in rejecting his judgment: I find the two equally bad. The equivalence is even clearer if the verb is attract or annoy.

(60)  a. *John was attracted to/annoyed with the dog, but the dog did not attract/annoy John.
    b. *The dog attracted/annoyed John, but John was not attracted to/annoyed at the dog.

However, if we change the verb to frighten, there is a difference.

(61)  a. *John was frightened by the news, but the news did not frighten John. [contradictory]
    b. The news frightened John, but John was not frightened of/about the news.
          [noncontradictory]
Note that if of/about is changed to by in (61b), the sentence does become contradictory, for now the second clause is the passive of the first. This variation among the Stimulus-subject verbs confirms the conclusion that there is a lot of lexical variation in whether they require the Stimulus to be identical with the agent.

We end up with the following situation for the Stimulus subject verbs. The simple noncausative readings are in general like the analysis of interest above; (62a) shows the general form. The causative readings vary in the status of the Stimulus argument; (62b-d) give three cases.

(62) 

a. Verbs with Stimulus subjects, noncausative (e.g. appeal to, please, interest):
   Syntax: \( NP_1 \ V \ NP_2 \) or \( NP_1 \ V \ [pp \ P \ NP_2] \)
   Semantics: \( Y_2 \ BE \ [FEELING \ (X_1)] \)

b. Verbs with agent subjects, Stimulus as extra argument (e.g. (57))
   Syntax: \( NP_1 \ V \ [PP \ P \ NP_2] \)
   Semantics: \( Z_1 \ CAUSE \ [Y_2 \ BE \ FEELING \ (X_3)] \)

c. Verbs with agent subjects, necessarily identical with Stimulus (e.g. attract, repel)
   Syntax: \( NP_1 \ V \ NP_2 \)
   Semantics: \( Y_1 \ CAUSE \ [X_2 \ BE \ FEELING \ (Y_1)] \)

d. Verbs with agent subjects, defeasibly identical with Stimulus, but Stimulus can either be different or absent (e.g. frighten, depress, excite) (defeasible argument is indicated in italics):
   Syntax: \( NP_1 \ V \ NP_2 \)
   Semantics: \( Y_1 \ CAUSE \ [X_2 \ BE \ FEELING <(Y_1)>] \)

Some of the causative verbs give rise to “causative” adjectives that can be used actively. A prominent example is annoying, which is very comfortable in progressive aspect, and denotes acting in a manner calculated to cause annoyance (63a). Such a context is next to impossible with astonishing (63b).

(63) 

a. Harry is being annoying. =
   HARRY \ BE \ [\lambda x \ [x \ CAUSE \ [YA \ BE \ ANNOYED \ (HARRY)]]]

b. *Harry is being astonishing.

This further confirms the lexical variation among these predicates.

That takes care of the six frames in (40), using the thematic tier alone. Now I want to go back and look at them again with the help of the macrorole tier.
7.4.5. *Adding the macrorole tier.* As observed in the introduction to this chapter, the original problem of the psychological verbs arose with minimal pairs like (64). (64a,b) are verbs discussed in this section; (64c) is of course a case we dealt with in section 7.3.

(64)  

<table>
<thead>
<tr>
<th>Experiencer subjects</th>
<th>Stimulus subjects</th>
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<tr>
<td>c. John regards Sue as smart.</td>
<td>Sue strikes John as smart.</td>
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Reviewing the treatment of sections 7.4.2-4, we ended up with structures like (65) for (64a).

(65)  

a. John fears rejection = JOHN BE [Property AFRAID (REJECTION)]  
   b. Rejection frightens John =  
      i. REJECTION BE [Property λz [JOHN BE [AFRAID (z)]]]  
      or  
      ii. JOHN BE [Property AFRAID (REJECTION)]

We found the choice between (65.i) and (65b.ii) problematic. On one hand, (65b.i) is formally overcomplicated, just for the sake of getting *REJECTION* on the outside of the expression so it can be linked to subject position. On the other hand, (60b.ii) is identical to (60a), so it is not clear why *fear* and *frighten* are two different verbs.  

The treatment of the macrorole tier in section 7.3 offers a resolution. All the verbs in (64) describe John’s state of mind, so they all contain the macrorole function *EXP*. Section 7.3 proposed that *EXP*, unlike *AFF*, does not inherently determine which macrorole is linked to subject position. Rather each *EXP* verb must individually mark its subject. This is exactly what we need for the contrasts in (64):

(66)  

a. John fears rejection =  
   b. Rejection frightens John =

In other words, we can abandon the overcomplex (65b.i) and still capture the difference between the verbs.

The macrorole tier also helps with the causative versions of the Stimulus subject verbs. When there is an overt agent, the macrorole tier has to include *AFF*, since the agent (a kind of Actor is acting on someone (who is therefore a Patient). For the clearest case, we can contrast the noncausative and causative versions of *interest*.

(67)  

a. Golf interests Sam.  
   [noncausative = ‘Sam is interested in golf’]

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b. That article interested Sam in golf.  [causative]
   \[
   \text{ARTICLE CAUSE \{SAM BE \{INTERESTED (GOLF)\}\}}
   \]
   \[
   \text{ARTICLE AFF SAM}
   \]

Similarly, the causation of an inherent feeling might be treated as ordinary causation with \textit{AFF}:

(68) The story depressed me = \[
\text{STORY CAUSE \{I BE DEPRESSED\}}
\]
   \[
   \text{STORY AFF ME}
   \]

The most interesting case, though, is when the agent and stimulus are identical, say \textit{Bill amazed me with his tricks}. An option here is to leave the thematic tier exactly the same but just change the macrorole tier.

(69) Bill amazed me =
   \begin{enumerate}
   
   \item[I BE [AMAZED (BILL)]]
   \item[agentive reading]
   \item[BILL AFF ME]
   
   \item[I BE [AMAZED (BILL)]]
   \item[pure experiencer reading]
   \item[I EXP BILL]
   \end{enumerate}

This would make the two readings of \textit{amaze} very much like the agentive and experiencer readings of \textit{feel} (cf. (23a,b)) or like \textit{look} and \textit{see}. The (69a) reading, since it is an action, has the passive counterpart \textit{I was amazed by Bill}; the (69b) reading has the counterpart with the passive adjective, \textit{I was amazed at Bill}. I am not sure this is the correct analysis and that \textit{CAUSE} can be dispensed with here; but the possibility is intriguing.

Turning to the adjectival cases, they all describe mental states, so if there is a macrorole tier at all (I am not certain whether there should be), the function should be \textit{EXP}. This gives us the configurations in (70a-d). The only possible exception would be the “causative” adjectives like \textit{annoying} (70e), which use \textit{AFF}.

(70) \begin{enumerate}

\item[I BE [AMAZED (BILL)]]
\item[agentive reading]
\item[BILL AFF ME]
\item[I BE [AMAZED (BILL)]]
\item[pure experiencer reading]
\item[I EXP BILL]
\end{enumerate}

\item[Inherent feeling]
\begin{enumerate}

\item[SAM BE BORED]
\item[SAM EXP]
\end{enumerate}

\item[Directed feeling]
\begin{enumerate}

\item[SAM BE [AMAZED (FRANK)]]
\item[SAM EXP FRANK]
\end{enumerate}

\item[Directed feeling]
\begin{enumerate}

\item[FRANK BE [\lambda z [SAM BE [AMAZED (z)]]]]
\item[SAM EXP FRANK]
\end{enumerate}

\item[Directed feeling]
\begin{enumerate}

\item[FRANK BE [\lambda z [YA BE [AMAZED (z)]]]]
\item[EXP FRANK]
\end{enumerate}

\end{enumerate}
e. Frank is being annoying.

\[
\text{FRANK BE } \lambda x \left[ x \text{ CAUSE } [\text{YA BE ANNOYED } (x)] \right] \text{ AFF }
\]

The only possible surprises here are (70a) and (70d). (70a) describes an experience of Sam’s that has no connection to the world, so there is no Stimulus on the macrorole tier. (70d), following the analysis of *Pat looks wonderful*, has no Experiencer on the macrorole tier. As a consequence the sentence expresses a perspective-free, “objective” judgment of Frank’s properties. And this – finally!! – is the result we have been seeking: the reason that *That problem P isn’t interesting* presents itself as an objective judgment.

### 7.5. Valence in the macrorole tier

Recall from section 7.2 that the macrorole function *AFF* comes with a valence. *AFF−* renders its second argument a Patient, a character that the event happens to; *AFF+* renders its second argument a Beneficiary, a character on whose behalf the event occurs. The difference between the two is often lexically marked, for instance *hurting* is *AFF−* and helping is *AFF+*. It is easy to show that the newly introduced macrorole function *EXP* has similar valence properties.

We start with the commonplace observation that emotions come with positive or negative valence – happy and calm vs. sad, angry, and scared. Thus part of the conceptual structure of inherent feelings ought to be a valence feature. Directed feelings have a valence too (with a few possible exceptions such as impressed and puzzled for which I have difficulty making a judgment). Let’s notate this with a plus or minus sign on the function.

(71) a. delighted about Z = [DELIGHT+ (Z)]
    b. disgusted with Z = [DISGUST− (Z)]

The valence of a directed feeling turns out to be reflected in the macrorole tier. This is clearest when the macrorole function is *AFF*, where we already know what valence means. Consider cases like causative *amuse* and *annoy*, which have analyses like (68) or (69a). When the feeling is of positive valence, such as *amuse*, the sentence is taken to benefit the Experiencer; when the feeling is negative, such as *annoy*, the sentence is taken to affect the Experiencer negatively. Thus we might say *AFF* is “tuned” to the valence of the feeling.

(72) a. What Sue did for/*to Tim was amuse him. (AFF+)
    b. What Sue did to/*for Tim was annoy him. (AFF−)

It makes sense to extend this tuning of valence to *EXP*.

(73) a. Sue is delighted with Tim. = \[SUE BE [DELIGHTED+ (TIM)]\]
    \[SUE EXP+ TIM\]
b. Sue is disgusted with Tim. = [SUE BE [DISGUSTED\(^-\) (TIM)]
\[SUE EXP^- TIM\]

We might think of EXP with a valence as ‘Experiencer has a good/bad experience of Stimulus’. (Other cases of EXP, for instance with the verb see, have a neutral valence.)

The principle for tuning the macrorole function to the valence of a feeling can be stated as (74).

(74) Tuning of valence
\[
[\ldots FEELING^\alpha \ldots]

\[(X) AFF/EXP^\alpha (Y)\]
\[\text{[where } \alpha \text{ ranges over } + \text{ and } -\]

This is a well-formedness condition on conceptual structures that guarantees that the two valences match.\(^{16}\)

Experimenting further, suppose we want to say formally that the experience of being delighted is (usually) good for you (i.e. in your interest), and the experience of being disgusted is (usually) bad for you (i.e. not in your interest). This is obviously not an analytic entailment, but it is a good bet for a defeasible one. In order to formalize it, we need a way of saying ‘good for you’ and ‘bad for you’, or more generally, ‘of positive/negative value to you’. (75) introduces a conceptual structure expression with the appropriate variables.

(75) VAL (X, Y) = ± ‘the value of X to Y is + or – ’

The defeasible inference rule we are looking for now can be stated in a very general form:

(76) Tuning of value to valence
\[\begin{align*}
a. \quad & \left[\text{[any thematic tier]}\right]^\beta \approx \times \text{VAL} (\beta, Y) = \alpha \\
b. \quad & \left[\text{[any thematic tier]}\right]^\beta \approx \times \text{VAL} (\beta, X) = \alpha \\
\end{align*}\]

What the hell does this say? First let’s clear the Greek characters out of the way. The \(\alpha\) gives us a choice of sign, positive or negative, and the two signs have to match. Thus this is saying that AFF\(^+\) leads to a positive value (good) and AFF\(^-\) leads to a negative value (bad). Positive or negative value of what? This is indicated by \(\beta\), which also serves as a superscript to identify the event taking place. So (76a) says that an event of helping has positive value, and an event of harming has negative value; (76b) says that a state of having a positive feeling has positive value,

\(^{16}\)I’m actually missing something here, because That’s not interesting should come out with negative value, even though the directed feeling itself is positive. Let’s put off this important technical detail for another occasion.
and a state of having a negative feeling has negative value. To whom? This is where the two rules differ. (76a) says that the event has value for the Patient/Beneficiary, the individual being harmed or helped. (76b) says that the state has value for the Experiencer.

Various predicates in conceptual structure we have encountered in the past two chapters have connected to the valuation features of chapter 2, those features that contribute to the “felt character” of experience. We now encounter yet another such point of connection. (76) describes the value of a situation to any Patient or Experiencer. But if the Patient or Experiencer happens to be oneself, one feels the situation viscerally as something pleasant or unpleasant. This corresponds to the valuation feature \[+affective: valence \pm\]. So here is another place where experience is conceptualized, enabling us to reason about others’ experiences as though they are parallel to our own.

The invocation of value opens up a Pandora’s box of issues. Chapter 9 begins to sort through some of these. However, having reached this connection to larger issues, it is time to let the experiencer predicates rest. There are still many fine points to be addressed. I regard this chapter more as a rapid preliminary thrust into new territory than a thorough exploration. Beyond the technical details of lexical semantics, I find two major points intriguing. First, the work in the past two chapters puts us in a position to address some of the formal properties of the Theory of Mind and thereby perhaps to clarify some of the issues that have arisen in experimental research, in the way that the formal study of syntactic structure and of spatial cognition have vastly enriched experimental research in those areas. Second, having established the notion of valence on the macrorole tier and having linked it to the valence of directed feelings on the thematic tier by rule (74), we’re immediately ready to vault naturally into the conceptual realm of values, and to formally distinguish subjective from (ostensibly) objective value. This gains us entry into important domains such as moral reasoning and cost-benefit reasoning. Some of this will be addressed in chapter 9.

7.6. Appendix: The treatment of “raising” and “control” with experiencer predicates

Section 7.2 spent a great deal of effort establishing the conceptual structure (77b) for the sentence (77a).

(77) a. Aaron appeared tired to Moses.
   b. \[\text{MOSES SENSE}_{\text{visual}} [\text{AARON BE TIRED}] \]
      \[\text{MOSES EXP AARON}\]

Verbs like appear have been far more intensively studied in the context of the following two syntactic frames:

(78) a. It appeared to Moses that Aaron was tired.
   b. Aaron appeared to Moses to be tired.
On the strength of the near-synonymy of these two sentences, (78b) is normally taken to be derived from underlying structure (79a), which parallels (78a) more closely. The derivation involves “raising” the subject of the subordinate clause to subject position in the main clause, as in (79b). By extension, (77) is usually assumed to be derived either by deletion of to be from (79b), or from an underlying structure with a “small clause,” such as (79c).

(79) a.  e appeared to Moses [Aaron be tired]
    b.  Aaron appeared to Moses [t be tired]
        [-----------------]
        e
    c.  e appeared to Moses [sc Aaron tired]

Why is this important? The standard assumption is that semantic roles are assigned in terms of positions in underlying syntactic structure. If (77) were derived from underlying structure (79c), it could not have a macrorole in the main clause.

What is nearly always neglected in discussions of appear and related verbs is the additional pair of syntactic frames in (80), which also mean about the same thing as (77) and (78).

(80) a.  It appeared to Moses {like/as if/as though} Aaron was tired.
    b.  Aaron appeared to Moses {like/as if/as though} he was tired.

But (80b) cannot be derived from (80a) by raising, since it still has a subject in the subordinate clause.17

There is however a difference between the constructions in (78b) and (80b): only (78b) is possible when the subject is an expletive or idiom chunk.

(81) a.  There appears to be a problem here.
    b.  The shit appears to have hit the fan.
    c.??There appears as if there’s a problem here.
    d.??The shit appears as if it’s hit the fan. (only good on literal reading)

The grammaticality of (81a,b) is usually taken as further evidence for raising in (78b) – and against raising in (80b).

17There have been some recent rumblings in the literature (refs?) about deriving (80b) by some sort of “copy raising,” where Aaron both raises and leaves a pronoun copy in its original position. However, further exploration of the construction reveals the futility of such an approach: in other instances of the construction, the main and subordinate subjects need not be identical.

(i)  Aaron appears to Moses as though his goat has been causing trouble again.
    Aaron appears to Moses as though Miriam has been making stupid demands on him again.

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Now: if (80b) is not derived by raising from (80a), then appear must permit a syntactic subject. What semantic role is assigned to it? I suggest that, as in the traditional analysis, it does not receive a thematic role; however, it does receive the macrorole Stimulus. In other words, the difference between (80a) and (80b) is as shown in (82).

(82) a. (80a) = [MOSES SENSE\text{visual} [AARON BE TIRED] ]
MOSES EXP
b. (80b) = [MOSES SENSE\text{visual} [AARON BE TIRED] ]
MOSES EXP AARON

But of course (82b) is the same as (77b). Thus there is no need to derive (77a) by raising.

An examination of other experiencer predicates verifies that (77) is more closely related to (80) than to (78). Although seem, like appear, occurs in all the frames, look, sound, and feel allow the frames (77) and (80) but not (78).

(83) a. Aaron seems/looks/sounds/feels tired to Moses.
b. It seems/*looks/*sounds/*feels to Moses that Aaron is tired.
c. Aaron seems/*looks/*sounds/*feels to Moses to be tired.
d. It seems/looks/sounds/feels to Moses like Aaron is tired.
e. Aaron seems/looks/sounds/feels to Moses like he’s tired.

Notice that whether or not the subject of (78b) is derived by raising, if it is contentful the choice can matter. Compare (84a,b,c), which all mean subtly different things.

(84) a. Harry appears to Bill to have chosen Max for the job.
b. ≠ Max appears to Bill to have been chosen for the job by Harry.
c. ≠ It appears to Bill that Harry has chosen Max for the job.

The difference in meaning is not so much in truth-conditions as in where Bill’s attention is directed. In (84a) he is attending to Harry, in (84b) to Max; (84c) does not report the focus of his attention. This difference translates directly into macroroles: Harry is Stimulus in (84a), Max in (84b), and the whole situation in (84c). This is independent of whether Harry and Max have arrived in their position by raising or not.

On the other hand, in (81a,b), there and the shit clearly cannot be interpreted as Stimulus. What makes the difference? What seems to be going on is a default principle:

(85) Whenever the subject of a Stimulus-subject verb can be interpreted as Stimulus, it is interpreted as Stimulus.