

PERCEPTS AND COLOR MOSAICS
IN VISUAL EXPERIENCE

PROFESSOR FIRTH'S "Sense-Data and the Percept Theory"¹ examines a disagreement over the nature of visual experience. Those in the traditions of British empiricism² and introspectionist psychology³ hold that the content of visual experience is a sensuously given mosaic of color spots, together with a mass of interpretive judgments injected by the subject. Firth calls this the Sense-Datum Theory, but I shall call it the *Color-Mosaic Theory* (since the opposing theory also accepts something we might call a sense datum). Those in the newer traditions of linguistic phenomenology,⁴ Husserlian phenomenology,⁵ and Gestalt psychology⁶ agree that visual experience consists rather of sensuously given *percepts*—presentations of ostensible constituents of the external world. Firth calls this the *Percept Theory*, as shall I. He himself is one of a growing number of epistemologists who accept it.

As we shall see in the next section, Firth shows how the difference between the two theories may be stated as a disagreement over a certain thesis: the *Exposure Hypothesis*. Color-mosaic theorists implicitly accept the Exposure Hypothesis; percept theorists such as Firth reject it.

I claim that the Exposure Hypothesis, properly understood, does not conflict with Firth's Percept Theory. I shall propose an interpretation of the Exposure Hypothesis and the central thesis of the Color-Mosaic Theory within the terms of the Percept Theory itself. If I am right, disagreement over the Exposure Hypothesis is not disagreement over the nature of visual experience, but only over the value of a certain way of speaking.

THE EXPOSURE HYPOTHESIS

The Percept Theory introduces percepts as presentations of objects ostensibly in the external world before the subject. These objects need not be concrete. They may be qualities or processes: in a brief glance I

¹ *Mind*, 58 (1949), 434-465; 59 (1950), 35-56.

² See Berkeley, *An Essay towards a New Theory of Vision*.

³ See Titchener, *A Textbook of Psychology* (New York, 1928), pp. 1-92.

⁴ See Austin, *Sense and Sensibilia* (Oxford, 1962).

⁵ See Husserl, *Ideas: General Introduction to Pure Phenomenology*, trans. by W. R. Boyce Gibson (London, 1931), pp. 101-111.

⁶ See Koehler, *Gestalt Psychology* (New York, 1947), pp. 67-99.

may have a percept of roundness, or out of the corner of my eye I may have a percept of a sudden movement, but in neither case do I necessarily have a percept of any definite round or moving thing. Perhaps we do best to understand percepts as presentations of ostensible *facts*:⁷ I have a percept of a tree when I am ostensibly seeing that there is a tree before me, of roundness when I am ostensibly seeing that there is something round before me, of a movement when I am ostensibly seeing that there is something moving before me.

Whether concreta, abstracta, or facts, the objects of percepts are intentional *Gegenstaende*, presented qua falling under specific descriptions. They are no more or less determinate than the descriptions under which they are presented. If I see the speckled hen and do not count the speckles, my percept is of an ostensible hen which is many-speckled, but is not n -speckled for any number n . If I see an "E" and do not see it as containing an "F" (even if I know it does) the ostensible "E" which is the object of my percept cannot be said to contain an "F." If I see a reversing cube as slanting up, I have a percept of an ostensible up-slanting cube. If later I count the speckles, or see the "F," or reverse the aspect of the cube, I have changed a percept of one ostensible object into a new percept of a new (more or otherwise determinate) ostensible object. When I notice something new—say, a snake in the grass—I get a new percept. When I so much as shift my visual attention—say, from the foreground to the background of the scene around me—I lose old percepts and gain new ones. The Percept Theory aims to cover the whole content of visual experience, leaving no residue to be covered under catchall headings of noticing, attending to, and seeing as.

It aims likewise to cover every variety of ordinary or extraordinary visual experience. Among the extraordinary varieties it includes that very color-mosaic experience which color-mosaic theorists regard as all-pervasive.

Percept and color-mosaic theorists would agree that visual experience may be made to contain nothing but a mosaic of color spots—a visual experience which could be reported exhaustively by a set of "I am ostensibly seeing that something of color c is located in direction d " clauses for all discriminable directions. To produce this pure color-mosaic experience we must concentrate, to the exclusion of all else, on the visual qualities of the smallest discriminable regions considered in isolation from their surroundings. Firth calls this the operation of

⁷ See D. M. Armstrong, "A Theory of Perception," *Scientific Psychology: Principles and Approaches*, ed. by B. B. Wolman (New York, 1965), pp. 489-505.

perceptual reduction. It is a difficult task practiced by artists and by introspectionist psychologists.

A color-mosaic theorist must admit that he needs to perform perceptual reduction before he can (easily and with confidence) observe the sensuously given color mosaic which he claims is present in all visual experience. The color mosaic observed is notoriously often not what one might have expected beforehand. He may explain that perceptual reduction is needed because we do not ordinarily notice the color mosaic, since it is of no practical importance, but attend instead to our own interpretive judgments based on it. Perceptual reduction is a redirection of attention in which we dispel the judgments that occupy our attention and expose to observation what remains: their hitherto unnoticed *sensory core*.

The Exposure Hypothesis is the essential thesis in this account of perceptual reduction: the thesis that the color-mosaic experience someone has after he performs perceptual reduction is somehow *the same as* something that was already present in his visual experience before reduction.

In Firth's own words:

According to the Exposure Hypothesis, the operation of perceptual reduction does not produce a state of consciousness which is simply *other than* the original state of perception on which it is performed. It produces, on the contrary, a state of direct awareness which was contained in the original perception.⁸

Since the Exposure Hypothesis invokes the notion of unnoticed aspects of experience it is *prima facie* contrary to the Percept Theory. Why should a percept theorist regard perceptual reduction as "anything more than one method among many of substituting one state of consciousness for another"⁹ with any special claim to yield "the real but previously unobservable content of the original state?"¹⁰ Why not say that when someone adopts the special standpoint of perceptual reduction he just creates a percept of a color mosaic in place of whatever percepts he had before?

The Color-Mosaic Theory requires the Exposure Hypothesis, since all parties agree that the color mosaic can be observed only after perceptual reduction. Conversely, if we assume that perceptual reduction is always in principle possible, the Exposure Hypothesis seems to imply the Color-Mosaic Theory. This is to say that the issue between the

⁸ *Op. cit.*, Pt. I, p. 462.

⁹ Firth, *op. cit.*, Pt. I, p. 463.

¹⁰ *Ibid.*

theories is acceptance or rejection of the Exposure Hypothesis; and if Firth is right, the Hypothesis is no more than a misdescription of perceptual reduction.

I find this diagnosis unconvincing. Why was the Color-Mosaic Theory once generally accepted, and why is it still plausible, unless there is more behind it than Firth recognizes?

CHANGE OF PERCEPT AND PERCEPT OF CHANGE

Now I must digress to introduce some concepts within the terms of the Percept Theory, to be used in interpreting the Exposure Hypothesis and the Color-Mosaic Theory.

We first distinguish between changes of percept and percepts of change. There is a change of percept whenever one gains or loses a percept—that is, whenever there is any change in the content of one's visual experience as reported in "I am ostensibly seeing that . . ." clauses. Change of percept is not itself part of the content of visual experience. Indeed, it may go unnoticed and not be part of the content of experience at all. Changes of percept take place all the time; usually there are some due to changes in the external world, and always there are some due to one's own noticings, attention shifts, or (less often) aspect shifts.

A percept of change, on the other hand, *is* part of the content of visual experience. It is the visual presentation of some sort of ostensible change—a movement or a change in light or color—in the external world. It is what occurs when one is ostensibly seeing that something before him is somehow changing. The manner and the subject of change may be more or less determinate: one may ostensibly see that the trees are swaying, or one may ostensibly see just that something or other is happening to something or other.

A percept of change is normally accompanied by a corresponding change of percept, since any large change in the pattern of light impinging on the eye produces both. There is a percept of change because the process of change itself is perceived. There is a change of percept because the change leaves things changed. When it does *not* leave things changed, as when a lamp flickers too fast to follow, there is a percept of change without a change of percept. Or if the ostensible change is illusory, as when one is dizzy and the world turns, or as in the waterfall illusion,¹¹ there is a percept of change without a change of

¹¹ Described by William James in *The Principles of Psychology*, II (New York, 1890), pp. 245-246.

percept. Such cases show that percepts of change cannot always be analyzed as noticings of changes of percept.

Although a percept of change is normally accompanied by a corresponding change of percept, many changes of percept are not accompanied by corresponding percepts of change: namely, at least all those changes of percept which are due to one's own noticings, attention shifts, or aspect shifts. These unaccompanied changes of percept may go unnoticed; and even if one of them is noticed, the noticing of it is not a percept of change since it is not a *visual* presentation of ostensible *external* change.

Indeed, no change of percept is accompanied by a corresponding percept of change if it is slow enough. If I watch the minute hand of a clock, I have several changes of percept every minute, but no percepts of change. But any change of percept could presumably occur suddenly; and among sudden changes of percept a clear distinction appears between those which are accompanied by corresponding percepts of change and those which are not.

MODIFICATION EQUIVALENCE

Let us call a change of percept a *modification* of visual experience just in case it is sudden but is not accompanied by a corresponding percept of change. Let us say that one (actual or possible) particular¹² visual experience (E_1) is *directly modifiable* into another one (E_2) just in case they are experiences belonging to the same person and he can in principle (he can or he could but for his inadequate powers of concentration) go from E_1 to E_2 by one modification. Let us likewise say that E_1 is *modifiable* into E_2 just in case they are experiences belonging to the same person and he can in principle go from E_1 to E_2 by finitely many modifications. (Thus direct modifiability is a—presumably proper—subrelation of modifiability.) Let us further say that any two (actual or possible) particular visual experiences (E_1 and E_2) are *modification-equivalent* just in case there is some finite sequence (S) of (actual or possible) particular visual experiences, such that E_1 and E_2 are the first and last terms of S , and such that if E_j and E_k are adjacent terms of S then either E_j is directly modifiable into E_k or E_k is directly modifiable into E_j . Expressing the definition of modification equivalence by a recursion: (1) E_1 is modification-equivalent to E_1 ; (2) if E_1 is modifi-

¹² I. e., one which happens—or could happen or could have happened—to a definite person at a definite time. We will consider only the experiences of any one person, not the relations between experiences of different people.

cation-equivalent to E_m , and if either E_m is directly modifiable into E_n or E_n is directly modifiable into E_m , then E_1 is modification-equivalent to E_n ; and (3) visual experiences are modification-equivalent only if they are so by virtue of (1) and (2).

Whatever the logical properties of the underlying relation of direct modifiability may be, modification equivalence is an equivalence relation—reflexive, symmetric, and transitive. It divides a person's visual experiences (unless they are all modification-equivalent) into several disjoint *modification-equivalence classes*, such that a visual experience is modification-equivalent to all and only members of its own class.

Modifiability is a subrelation of modification equivalence. It is a proper subrelation; for modifiability implies precedence in time and so must be asymmetric, whereas modification equivalence is symmetric. If E_1 is modifiable into E_2 , E_1 precedes E_2 , so E_2 is not modifiable into E_1 ; but E_2 is modification-equivalent to E_1 . What is more, if some modifications—for example, some noticings—are in principle irreversible, there may be pairs of visual experiences which are modification-equivalent although neither is modifiable into the other. Let E_0 be my visual experience just before I notice a snake in the grass; let E_1 be my visual experience just after I notice the snake; let E_2 be the visual experience I would have had slightly later, had I not noticed the snake. E_1 and E_2 are modification-equivalent because E_0 is modifiable into both. E_2 is not modifiable into E_1 because E_1 precedes E_2 . And E_1 is not modifiable into E_2 because my noticing of the snake is—so far as I know—irreversible; I cannot *disnotice* the snake.

A performance of perceptual reduction is, in general, a finite sequence of modifications¹³ going from some original visual experience to a pure color-mosaic experience. The original experience is therefore modifiable into, and a fortiori modification-equivalent to, the color-mosaic experience which is its reduction product.

In trying to say how the operation of perceptual reduction may be said to leave visual experience the same, I do not claim that it is radically unlike other "methods of substituting one state of consciousness for another." I claim rather that it belongs to a large family of opera-

¹³ If perceptual reduction could be performed gradually, it would not be a sequence of modifications, since modifications are by definition sudden. But so far as we know, the results of gradual perceptual reduction could always be duplicated by jerky perceptual reduction. So we can confine ourselves, with no loss of generality, to the case of jerky perceptual reduction.

tions, *all* of which may be said to leave visual experience the same: namely, operations which change visual experience only by producing modifications.

THE DISTRIBUTION PREMISE

The observation that perceptual reduction changes visual experience only by modifications will permit me to interpret the Exposure Hypothesis. But to interpret the Color-Mosaic Theory I shall also need the following *Distribution Premise*: pure color-mosaic experiences are distributed among modification-equivalence classes in such a way that each class includes instances of one and only one pure *color-mosaic percept* (that being defined as a percept of a color mosaic and of nothing else). This is to say that every visual experience is modification-equivalent to some pure color-mosaic experience, and that all those pure color-mosaic experiences which are modification-equivalent to any one visual experience are pure experiences of the same color mosaic—that is, instances of the same pure color-mosaic percept. Since modification equivalence is reflexive, it follows that pure color-mosaic experiences are modification-equivalent only if they are instances of the same pure color-mosaic percept.

The Distribution Premise implies that there is precisely one color mosaic which can be observed after perceptual reduction of any given visual experience, even if the reduction can be performed via several alternative routes. Perceptual reduction is the operational counterpart to the well-defined function which assigns to each visual experience *E* that unique color mosaic *C*, such that *E* is modification-equivalent to pure experiences of *C*. It is for this reason that color-mosaic experience and the operation of perceptual reduction have a special importance—not because perceptual reduction produces change in some *sui generis* way.

The Distribution Premise is, clearly, an empirical thesis. We find it somewhat plausible because it fits our rough understanding of the way visual experience is caused. We suppose that a sudden change of percept is accompanied by a corresponding percept of change—is not a modification—just in case it is produced directly by a change in the pattern of impinging light. If so, the distinction between those sudden changes of percept which are modifications and those which are not is a correlate in phenomenal terms of the distinction between those which are internally produced and those which are externally produced. It follows that a modification-equivalence class should comprise just those visual experiences which can occur under some one pattern of light. We

also suppose that pure color-mosaic percepts correspond precisely to the patterns of light under which they can occur. The two suppositions jointly imply that every modification-equivalence class should contain instances of precisely one pure color-mosaic percept: that one corresponding to the pattern of light under which members of the class can occur.

But our real reasons for accepting the Distribution Premise do not matter. The Premise was stated in purely phenomenal terms. In principle we could forget our causal preconceptions and test the Premise just by examining enough experience (though in reality we would never take the time to do so). So if the Distribution Premise is true, it is available even if (as phenomenologists or epistemologists) we insist on confining ourselves to pure description of visual experience without mention of its causal conditions.

CLASSIFICATION OF VISUAL EXPERIENCE

Let us call two (actual or possible) particular visual experiences *percept-equivalent* just in case they are instances of precisely the same percepts—that is, just in case they could be reported exhaustively by precisely the same “I am ostensibly seeing that . . .” clauses. Percept equivalence is an equivalence relation and therefore divides a person’s visual experiences into several disjoint *percept-equivalence classes*, such that a visual experience is percept-equivalent to all and only members of its own class.

The Percept Theory may suggest that we ought to interpret the relation of *identity in kind* between visual experiences as percept equivalence, thereby classifying visual experiences according to the percepts they contain. But we are free to adopt whatever principle of classification we find convenient for our purposes at hand. The choice of a principle of classification is nothing more than a choice between alternative ways of speaking. Any salient equivalence relation which can be defined within the terms of the Percept Theory is a possible principle of classification and might, if convenient, be adopted. Percept equivalence and modification equivalence are two such equivalence relations. I suggest that for some purposes we have reasons to adopt the latter—to interpret identity in kind as modification equivalence and thus to classify visual experiences according to their modification-equivalence classes. There is nothing incorrect in classifying by percept equivalence; but classifying by modification equivalence is *as* correct, and sometimes more convenient.

Classification by percept equivalence does capture all discriminable differences in content. This sensitivity is both a virtue and a fault. We sometimes want judicious omission of detail in order to emphasize what we think important—diagrams instead of photographs. Just as we may not want to distinguish all the discriminable colors, so we may not want to distinguish all visual experiences which are not percept-equivalent. If identity in kind is to be a useful concept it must often be applicable. We cannot afford to set too high a standard.

In particular, we may often wish to ignore the perpetual flux of modifications: the noticings, attention shifts, and aspect shifts. We may regard the important features of visual experience as those which vary between modification-equivalence classes but not within them. Consider especially the context of epistemology: we might want to ignore differences within a modification-equivalence class because—unofficially speaking¹⁴—we suppose they are not due to differences in the impinging light and hence carry no information about the external world.

There seems to be no way of classifying by partial percept equivalence which would ignore all and only differences within modification-equivalence classes. So far as we know, any percept or any number of percepts in a visual experience may be changed by modifications. What is invariant under all modifications must be something very complicated, unless we are prepared to say it is just modification-equivalence class affiliation itself.

But modification equivalence does not just ignore some differences which percept equivalence captures. It also captures other differences which percept equivalence ignores. Neither is a subrelation of the other. Two percept-equivalent visual experiences may have quite different potentialities for modification. When I glance at the grass on two occasions I may have the very same percept of tall, brown, ragged grass; but on one occasion I can notice a snake in the grass if I look harder, whereas on the other occasion I cannot, since there is no snake to be seen. The two visual experiences are percept-equivalent but they are not modification-equivalent. Percept equivalence is the strongest possible equivalence relation between visual experiences on the basis of actual content alone. But modification equivalence sacrifices some sensitivity

¹⁴ Officially, we cannot give this reason for ignoring such differences, since we are trying to describe visual experience prior to explaining it by causal conditions. But we can just ignore them for *no* legitimate reason and hope to be justified afterward by success in reaching a simple and adequate epistemology.

to actual content in return for some sensitivity to potential content. There is no reason to exclude potentialities from our account of the nature of visual experience, so long as they are potentialities within the realm of experience itself, described without mention of the external causes and effects of experience.

A RATIONALE FOR THE COLOR-MOSAIC THEORY

If we do choose to take identity in kind as modification equivalence, we have adopted a way of speaking on which we must say that perceptual reduction leaves visual experience the same. For perceptual reduction is just a sequence of modifications, of changes of the sort we have chosen to ignore. We shall therefore say that the original visual experience and the pure color-mosaic experience which is its reduction product, being modification-equivalent, are identical in kind. In fact, "the operation of perceptual reduction does not produce a state of consciousness which is simply *other than* the original state of perception on which it was performed. It produces, on the contrary, a state of direct awareness which was contained in"—we might better say, "which is the same as a state contained in"—"the original perception." This is the Exposure Hypothesis.

Not only is a visual experience identical in kind to its product under a particular performance of perceptual reduction; granted the Distribution Premise, any visual experience is identical in kind to instances of precisely one pure color-mosaic percept. In this sense every visual experience can be described as experience of some definite color mosaic, so color-mosaic experience is all-pervasive. This is the Color-Mosaic Theory.

It would indeed be just as true to say that *non-color-mosaic* experience is all-pervasive. For a visual experience is in general modification-equivalent both to color-mosaic experiences and to non-color-mosaic experiences. (Thus we must take some properties of visual experience as compatible when we classify by modification equivalence which are not compatible when we classify by percept equivalence: namely, properties which vary between modification-equivalent visual experiences. Being color-mosaic experience and being non-color-mosaic experience are two such properties.) The point of describing all visual experience as color-mosaic experience is not that it can be described as *nothing but* color-mosaic experience; rather, that it can be described *inter alia* as definite color-mosaic experience, and so described it is especially amenable to systematic comparison and causal explanation.

If we have chosen to classify by modification equivalence only, and it turns out that now and then we must speak of the differences in percept between modification-equivalent visual experiences, we can get by in a clumsy way without resorting to classification by percept equivalence (which would be better if we had *much* need to speak of those differences). We can think of the differences in percept between any visual experience and some modification-equivalent reference experience (or between any visual experience and the members of some class of mutually percept-equivalent experiences, all of which are modification-equivalent to it) as being itself an element superimposed on the sensuously given in visual experience. These difference elements are the interpretive judgments which, according to the Color-Mosaic Theory, surround the sensory core. Since these difference elements are differences from the reference experience(s), a reference experience itself can contain none. Under the Distribution Premise, the pure color-mosaic experiences which are modification-equivalent to a given visual experience make an especially convenient reference class; for there are always some such, and they are always mutually percept-equivalent. Thus it is understandable that color-mosaic experience should seem to be visual experience purified of its nongiven elements. I think, however, that the Exposure Hypothesis and the Color-Mosaic Theory are wrong on this point: the difference elements have an equal claim to be regarded as part of the given, and color-mosaic experience has no other special status than that which it has by virtue of the Distribution Premise and by virtue of the supposed precise correspondence between color mosaics and patterns of impinging light. I have tried to make sense of two doctrines: that perceptual reduction leaves visual experience the same, and that color-mosaic experience is all-pervasive. I take it that these two doctrines, not the mistaken notion of nonsensuous interpretive judgments, are the essential content of the Exposure Hypothesis and the Color-Mosaic Theory.

I have been defending the Exposure Hypothesis and the Color-Mosaic Theory by attempting to show how they might be restated in the percept theorist's own terms. It might seem that Firth himself does no less:

We can say that the statement, "These two perceptions are different interpretations of the same sensory core," should be understood to mean: "If these two perceptions were perceptually reduced exactly similar states of direct awareness would be produced in the two cases." And to understand this second statement, of course, we do not need any concepts which are incompatible with the Percept Theory. . . . By means of this definition in use, then, philosophers and psychol-

ogists who accept the Percept Theory can translate into an empirical language statements about the given which would otherwise be verifiable only if the Exposure Hypothesis were valid. In preferring this definition, moreover, they do not necessarily belittle the importance for psychology of either the operation of perceptual reduction or the concept of the sensory core which is defined in terms of it. To deny the existence of the sensory core as traditionally conceived, therefore, is not necessarily to discredit the empirical science erected by psychologists who have assumed its existence, nor even to disparage their method.¹⁵

But to interpret the Color-Mosaic Theory (excluding the notion of nonsensuous interpretive judgments) and to show that the color-mosaic theorist is justified in speaking as he does, it is not enough to find substitutions which turn part of what the color-mosaic theorist says into something we, as percept theorists, can accept. We could turn part of phlogiston chemistry into something we can accept by substituting "combines with oxygen" for "releases phlogiston," but that is to *correct* phlogiston chemistry, not to translate or interpret it, and not to justify it as a way of speaking. The "translation" Firth prescribes is so called only by a euphemism, for it is not complete enough to exhibit any rationale for the way the color-mosaic theorist speaks—to show any reason except erroneous understanding for speaking that way. I believe my more elaborate correlation between the color-mosaic theorist's way of speaking and the percept theorist's way has shown legitimate reasons for even a percept theorist to speak in the color-mosaic theorist's way on occasion.

Finally, how can this line of defense help the traditional color-mosaic theorist who had no theory of modification equivalence? Did he reach a defensible conclusion only by accident, for entirely indefensible reasons? I think we can give him more credit than that. A typical color-mosaic theorist, if challenged, might well have agreed that we do in a sense change visual experience in order to observe a color mosaic, and then might have gone on to say that this change is one of many which we can safely ignore because they are changes which are not ostensibly due to changes in the external world, and because they are changes which cannot take us from one color mosaic to another. If he could say this much—even if he misdescribed the nature of those changes—then he would have had the essential point.

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¹⁵ *Op. cit.*, Pt. II, pp. 39-40.