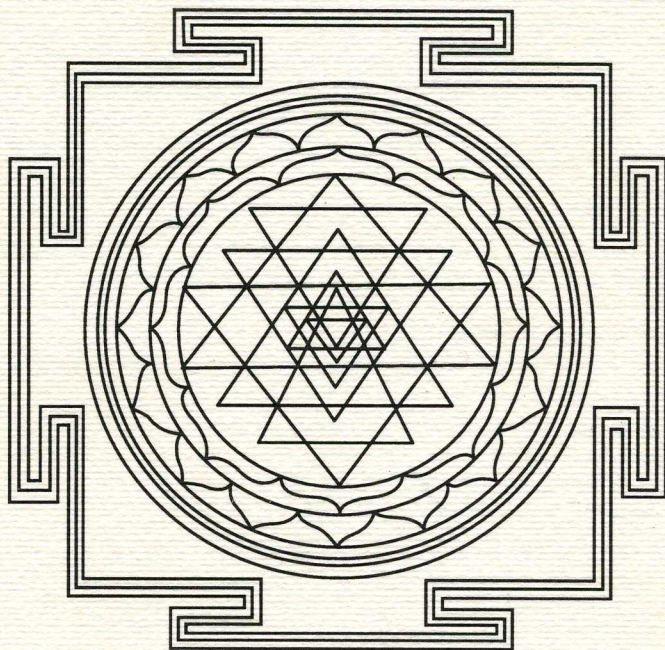# A&P

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Articles

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Fiona Macpherson

Department of Philosophy, Harvard University
Department of Philosophy, The University of Stirling

Perfect Pitch and the Content of Experience

Summary   This paper examines the representationalist view of experiences in the light of the phenomena of perfect and relative pitch. Two main kinds of representationalism are identified - environment-based and cognitive role-based. It is argued that to explain the relationship between the two theories a distinction should be drawn between various types of implicit and explicit content. When investigated, this distinction sheds some light on the difference between the phenomenology of perfect and relative pitch experiences and may be usefully applied to describe the nature of experiences in the other sense modalities.

Keywords:

Representation, experience, phenomenal character, content, non-conceptual, implicit, explicit, perfect pitch, perception.

Introduction

Much current literature on the nature of experiences treats them as content-bearing states. One prominent view - the representationalist view - claims that experiences are essentially content-bearing states and that any intrinsic differences between them, including differences in their phenomenal character, are differences in content[1]. While I don't wish to completely endorse this view, I think that there are important and close connections between the phenomenology of experience and the content of experience. Thus, it is informative to try to account for differences in experience by differences in content. Proponents of this view have focused almost exclusively on visual experiences and it is assumed that it can be extended unproblematically to experiences in other sense modalities[2]. In this paper I will examine a feature of auditory experiences, namely, the representation of pitch and will argue that certain important distinctions need to be recognised to best extend the representationalist view to cover auditory experiences. These distinctions may then yield insights into the nature of content in other sense modalities.

What is Perfect Pitch?

An unusual feature of hearing is that some people have perfect pitch while others have relative pitch. People are described as having perfect pitch when they can uniquely identify the pitch of a note. For example if a middle C is played, they can identify this note in iso-

lation without a given reference note. Along with this ability usually goes the ability to pro-
duce a note of a certain pitch, without hearing a reference note. This ability is rare, even
amongst professional musicians, occurring in less than one percent of the general population[3].
Most people only have relative pitch. That is, when played two notes they have the ability to
tell how far apart in pitch the notes are. If a middle C is played and a note above it is played,
say the C above it, subjects can tell that the notes are an octave apart. These people cannot
identify what pitch a note is unless they are given a named reference note. (There may also be
a third category of people who are tone deaf. I take it, however, that this means that they lack
relative pitch or, more plausibly, their relative pitch abilities are particularly poor or limited.)

        There is little psychological research on perfect pitch and no firm conclusions about
its nature have been reached. Many adults have made numerous and rigorous attempts to see
if they can attain perfect pitch and have failed. In fact only one adult subject has ever man-
aged to train to achieve perfect pitch and this took him several years. Some studies conduct-
ed early this century, however, suggest that up to 80% of young children can be taught the
ability. This had lead to the postulation of either an imprinting model of learning or a genet-
ic basis for the ability[4].

The Content of Experiences

        Conceptual content can be ascribed to visual experiences based on the model of the
ascription of content to the propositional attitudes. One can see that such and such is the case
and the proposition that specifies what is seen or what one seems to see demarcates the con-
ceptual content of the experience[5]. There are, however, reasons for thinking that visual expe-
riences have nonconceptual content, either in addition to or instead of conceptual content.
Firstly, visual experience is more fine-grained than conceptual content. For example, one can
see more shades of colour than one can name. Secondly, to best describe and explain a sub-
ject's behaviour, there may be pressure to ascribe to a subject a visual experience with a con-
tent when the subject either lacks the concepts required to specify the content or is not a con-
cept user at all[6].

        There is a substantive question concerning how nonconceptual content should be
specified. Cussins (1990) suggests that it should be specified by a subject's abilities to dis-
criminate and track objects. An alternative account is offered by Peacocke (1992), in which
experiential contents are scenarios, which are spatial types that specify the ways in which the
space around the perceiver could be filled out consistent with the content being a correct rep-
resentation of the environment. For my purposes in this paper, it will be sufficient merely to
state, using the familiar concepts of objects and properties in the world, what is represented,
while insisting that the subject of those experiences need not possess mastery of the concepts
used in the specification.

The Content of Auditory Experiences

Prima facie it looks as if this picture of the content of visual experiences can be transferred to auditory experiences. If one hears a car backfire then the conceptual content of the experience might be that the car backfired or that there was a loud bang. Alternatively, in line with the considerations outlined above one might hold that the experience has nonconceptual content.

Consider now the difference between *a person* with perfect pitch and *a person* with relative pitch when they both have a veridical experience of a note, say middle C. (I will call the relevant experiences a perfect pitch experience and a relative pitch experience respectively.)

A first thought might be that there is a difference between the experiences of the two people. For the representationalist, this will mean that there is a difference in the content of the experiences. One variant of this view would be that the experiences had the same nonconceptual content, but that because the person with perfect pitch heard the note *as* a middle C, their experience would have the additional conceptual content that middle C was heard.

Now while a perfect pitch experience may have this additional conceptual content, this further level of content *need not* be present. For example, the perfect pitch subject could be a child or an animal who possesses no concepts or none concerned with pitch. The question of precisely what it is for a subject to possess a concept lies outside the scope of this paper. I will assume in line with many philosophers that mere discriminatory abilities are not sufficient for concept mastery. Concept mastery should be seen as intimately linked with linguistic abilities and a grasp of the inferential role of concepts[7]. If this is correct, then there would be evidence for perfect pitch in a subject lacking pitch concepts if they could be trained to press a button when a note of a particular pitch was played without a reference note. John Booth Davis reports the case of perfect pitch in a parrot that always whistled the first four bars of Beethoven's 'Fifth' in the correct key[8]. Moreover, some psychologists postulate that people are born with the abilities associated with perfect pitch. Thus, conceptual content is not necessary in order to have a perfect pitch experience and therefore I shall limit the enquiry to the nonconceptual domain. From now on when I talk of content I will be referring to nonconceptual content.

Types of Experience and Theories of Content

Two options now present themselves. On hearing the same note, either the perfect pitch experience will differ from the relative pitch experience or the experiences will be the same. When we consider these options we have conflicting intuitions. There are reasons to think that the experiences are the same. For example, the two subjects can discriminate between notes similarly and hear the same range of notes. Therefore the experiences could be the same but how those experiences are utilised might be different. On the other hand, there are intuitions that the experiences are not the same For example, just because the subjects' abilities are so different, it seems the experiences themselves must be different.

On the representationalist theory, if the experiences differ there must be a difference in content. On the other hand, if the experiences are the same there will be no difference in content and a nonexperiential difference must be found that explains the subjects' different abilities.

In the remainder of this paper I will outline two current theories of representation. One theory will point towards the conclusion that there is no difference between a relative pitch experience and a perfect pitch experience and the other will support the view that there is a difference. I will then suggest a view of content that reconciles these theories and which does most justice to our conflicting intuitions about the phenomenology of the experiences. I will start with the view that the experiences are the same.

What other than the contents of the experiences could explain the different abilities the subjects have? In some psychological literature it is argued that subjects with perfect pitch and subjects with relative pitch have different types of memory for sounds. Reference is made to a template in memory consisting of a 'pitch spiral' representing the ascending tones[9]. A person with perfect pitch has the points on this spiral anchored. The pitch spiral of a person with relative pitch spins free, thus enabling the subject to maintain a relative pitch memory schema but not an ultimate basis on which to identify sounds. So perhaps the experiences of the two subjects might have the same content but only the subject with perfect pitch utilises this content in conjunction with their nonrelative memory schema.

Backing up this position are a number of views on what it is for an experience to have content that suggest the experiences do not differ in content. An account of content can perform a constitutive task namely, to give an account of what the content of a given state is, on the assumption that such a state has content. A simple causal, information-based theory of representation asserts that if optimal conditions were to obtain, a necessary and sufficient condition for one state to represent another is that it is caused by and covaries with that state[10]. This view of representation could vindicate the idea that both experiences could have the same nonconceptual content, for both states could be caused by and covary with the same note of a particular pitch, thus, representing that pitch. This is the view for example of Michael Tye regarding content and auditory experiences, although he does not distinguish between perfect and relative pitch. Given this type of view of content that stresses the relation between the experience and the environment in fixing the content of the experiences, one could hold that what they both represent is the same specific pitch[11].

Many theories of content, however, stress that if two experiences have different effects in a subject then there are pressures to ascribe different contents to the experiences. Consider the teleological theory forwarded by Millikan who argues that it is the consumers' use of representations that determine what is a representation and what the content of that representation is[12]. Similarly, a functional-role theory of mental content stresses the position a state occupies in either a causal, computational or inferential network, thereby giving weight to the effects that a state has in determining the content.

These theories reflect the thought that it is not just the relation between an experience and the environment that determines what the content of the experience is, but the behaviour of the subject and the cognitive utilisation of the experience are also determining factors. This approach to content appears to warrant the claim that the experience of a person

with perfect pitch and the experience of a person with relative pitch, when they hear the same note, have different contents. For example, the experiences have a different functional role, which is manifested in the different abilities of the subjects to reidentify the pitch of a note over time.

One suggestion of what the difference in content might be between a perfect pitch experience and a relative pitch experience is that a perfect pitch experience represents a particular pitch such as that called middle C, while a relative pitch experience represents only an indeterminate middle pitched note. A second note heard by a person with relative pitch that was slightly higher, or a determinate interval higher, than the first note might then represent a middle pitched note slightly higher, or a determinate interval higher, than the one heard before. The scope for identifying differences in content, however, appears limited.

Two types of theory of content have now been identified. One focuses on the relation between the experience and the environment, which I will call an environment-based theory, and the other places a distinctive emphasis on the subsequent role of the experience - a cognitive role-based theory. One might choose between these theories and adopt the resulting view of auditory experiences. Alternatively, one might attempt to integrate these theories of content. I will explore this possibility because it goes some way to accommodate our apparently conflicting intuitions regarding these experiences. It also provides a more plausible account of the phenomenology of the experiences than either theory of content provides on its own. This strategy will I hope illuminate the relationship between the two types of theories of content and show their mutual contribution and applicability to the field. The strategy is to distinguish implicit from explicit content.

Implicit and Explicit Content

There is, I believe, only one description of the phenomenology of experiences in recent philosophical literature that suggests that a distinction between explicit and implicit can be made within the contents of experience. William Earle (1954) describes two party goers who, he claims, have very similar experiences at a party. He claims that, nevertheless, one of the two people (a novelist) might be able to point out to the other (a philosopher) certain features of the philosopher's experience, which the philosopher had not noticed. "Whereas I [the philosopher] had been aware of nothing but a tired and banal affair he [the novelist] has seen all sorts of minor dramas, with characterizations and nuances of feeling to which I had been oblivious"[14].

Earle rules out by stipulation that the novelist and the philosopher had different experiences, in terms of what was available to be seen and what their attention was focused on. He also stipulates that their sense organs were of the same acuity. This he claims is a plausible scenario because the novelist is pointing out certain features of the philosopher's experience that the philosopher recognises as features of his own experience. The novelist 'clarifies' aspects of the philosophers experience, rather than providing him with new information. Further, he claims it is plausible to think that the novelist might not just be eloquently de-

scribing to the philosopher what he had seen, for the novelist is not just making generalisations about the experience or uttering words that the philosopher was unaccustomed to, but actually bringing insight to the philosopher that could be verified by the philosopher's own memory of his experience. The philosopher comes to notice certain details regarding his own experience that he had not done previously. Earle describes what has happened in this case by saying that certain contents in the philosopher's experience were only implicit in the experience and then they came to be explicit. He states:

"let us sum up how the implicit and the explicit are related. In common: they are both *phenomena*, that is they are both appearances to the subject, and not something hidden from experience altogether; and secondly they are in fact identical in *content*. An explicit phenomenon is not different in content from an implicit one; the explication or clarification is simply a rendering clear of what was already given, and not something else altogether. The clarified experience is the same experience as the implicit and inarticulate experience. There is absolutely only one content"[15].

I believe that the distinction between explicit and implicit content that Earle is pointing to can be plausibly explicated. If one holds, in accordance with the representationalist view, that differences in phenomenal character are differences in the content of experiences then, from a phenomenological perspective, one can classify the contents of experience into explicit, implicit1 or implicit2 types.

Let us say that the content of an experience is explicit content if it is *immediately* available to or grasped by a subject. The content of an experience is implicit1 if it is recoverable by processing by the subject of the experience (can be made explicit) without the subject being provided with any further information or without extending their capacities. The content of an experience is implicit2 if, provided with further information or abilities, a subject could recover the information (make it explicit) either immediately or through processing. These definitions are all relative to a particular subject and their circumstances at a particular time.

To explain these distinctions more fully I will give examples of how these distinctions are to be used. Firstly, consider the content of experiences of speech sounds. If I hear the words "It rains a lot in Glasgow", I immediately grasp the meaning of the words, being a fluent English speaker. The meaning of, "It rains a lot in Glasgow" is part of the content of that experience. Immediately grasping the meaning of words in our native tongue is a clear example of what it is for something to be immediately grasped, available to, or usable by the subject of an experience. We grasp the meaning instantaneously without reflection and without thinking of the words or the experience as being a vehicle for the content. (This latter point is the familiar one that experiences are transparent to their subjects[16].

What is it to immediately grasp the nonconceptual content of an experience? Relating back to the case of language, one should hold that to immediately grasp the nonconceptual content of one's experience is to be in the situation such that if one possessed the relevant concepts then one would be able to immediately conceptualise the content, grasp the meaning of a proposition that specified that content, and use it consciously as a premise in reasoning or as a reason for action. An experience containing explicit nonconceptual content

would be a particular conscious mental state that could immediately be used to initiate and control action or cause other mental states (such as long-term memories) pertaining to the nonconceptual content. Furthermore, the relation between the nonconceptual content and the action would be such that the concepts required to specify the nonconceptual content would, if constitutive of a propositional attitude, stand in a rationalising relation to the action in question. In other words, the subject can act in virtue of the explicit content.

A case that lends itself to description in terms of implicit and explicit content, is Dretske's discussion of Kluver's monkeys[17]. These monkeys are trained under experimental conditions to be able to discriminate the larger of any two differently sized triangles that are presented to them. This justifies the supposition that the content's of the monkeys' experience can be described as containing the larger than relation. After the initial training they are presented with three triangles of different sizes (A, B and C where A is the biggest and C the smallest). We can then assume that the monkeys' experience contains contents relating to triangles A, B and C but also, that A is larger than B, and that B is larger than C. Reflection on the logic of the situation would lead one to postulate that the experience of the monkeys must contain the content that B stands in the intermediate-sized relation to A and C. From experimentation, however, it is known that the monkeys are incapable of being trained to pick out the intermediate-sized of the three triangles.

A good description of this case is that the content of the monkeys' experience contained the intermediate-sized relation, but that the content was only implicit2. The monkeys could not grasp the intermediate-sized relation, in the sense that they were unable to act upon and pick out the middle-sized object in spite of the training they were given. Yet, it appears incumbent on us to postulate this relation in the content of the experience and to think that this is manifested in the phenomenology of the monkeys' experience. Logical relations between the larger-than relation and the intermediate-sized relation lead us to postulate the implicit content[18].

Another type of case that brings out certain features of what it is for an experience to have implicit content is the analogue nature of perceptual content. The term analogue has been used to express many different qualities of experience. It is fine-grained and carries lots of detailed information. It varies in a way that analogue devices, such as the hands of a clock do, as opposed to the discrete intervals that a digital watch displays. One particular notion of analogue experiential content is discussed by Christopher Peacocke (1986) and is concerned with the way in which magnitudes are represented. When we see a distance or length, although we see the length it is, we do not see the length it is in miles, kilometres, inches or centimetres - we do not come to know what the length is in any units unless, for example, there is a measuring device around. The same applies to shades of colours. We see a colour, say blue, and we see it as a particular shade of blue, but we don't know what that shade is without looking up a detailed colour chart.

Taking the case of normal colour perception as an example, we can tell what broad colour categories particular shades of colour fall under. That is to say we can know straight away whether something is blue or red. When it comes to the particular shades of colour that we see, however, we cannot identify them. Paint companies provide colour charts of various

shades, not just because lighting conditions may vary between the shop and the area to be painted, but because we generally cannot remember with sufficient accuracy the shade of familiar objects in our environment, to ensure that the paint will match or will not clash. The number of different shades of colour that people can discriminate is around ten million. The number of shades of colour which can be identified on an absolute basis varies from subject to subject but probably never exceeds a few hundred. In practical every day situations the number reduces sizeably to about twenty.(19)[19] The relatively stable ability of colour comparison, however, allows us to make up colour charts and shows that our experiences contain content relating to particular shades of colours, despite our inability to uniquely identify them.

It is clear that if we were presented with a shade of colour (say red_{29}) then we could use that experience to immediately initiate and control action relating to the content 'red'. For example we can quickly press a bell in response to all and only red things. Thus, an experience with the content red_{29} will contain the explicit content relating to redness (in a normal subject). We could not, however, use an experience caused by red_{29} to initiate or control action relating to the content regarding red_{29}. That is to say, we cannot learn to press a bell in response to all and only red_{29} things. Indeed, we would need extra information such as a colour chart to pick out red_{29} or act in virtue of the red_{29} content. The content regarding red_{29} is only $implicit_2$ in our experience.

Moreover, although one can act in accordance with a demonstrative concept relating to the shade one sees, this is not to act in accordance with the content relating to red_{29}. Peacocke (1986) shows that content regarding the analogue nature of experience is separate from the demonstrative content that figures in conceptual thought such as "that shade". This is because a subject could have an experience in which two shades looked the same to them. Associated with each of these shades could be a unique demonstrative mode of presentation - "that shade". The subject might nonetheless wonder whether the two shades are actually the same and it is possible that they might come to find out that in fact they were the same shade. Thus, it would be informative for the subject to know that the first "that shade" was the same as the second "that shade", and therefore the two demonstrative modes of presentation would not be the same, according to Frege's criterion for the identity of modes of presentation. So, in order to characterise the content of the perception regarding how the two shades look to the subject we cannot use demonstratives*

The Implicit/Explicit distinction applied to Perfect and Relative Pitch and the Theories of Content

With these notions of content in place and remembering that when talking of content I am talking of nonconceptual content, I would hold that the experience of the subject with perfect pitch has the explicit content that a note of a certain pitch is being heard, say middle C, because that content is immediately grasped or available to the subject. The experience of the subject with relative pitch has only the $implicit_2$ content that a middle C is played. This is because without any further information, that the note is middle C, is unrecoverable. Either the person needs additional information such as a reference note, or needs to acquire, if this

is possible, the ability of perfect pitch. The difference in content between the two experiences is thus not a difference in what the content is, but in how that content is represented.

An interesting case is those people who suffer from tinitus - a ringing in the ears. The ringing can always be of a specific pitch and, if the sufferer comes to know what pitch it is, then on hearing a note they can compare the pitch of that note to the ringing and work out what the pitch of the heard note was. The experience of hearing a note by the tinitus sufferer with relative pitch could be said to contain the pitch of the note implicitly$_1$, as they do not know the pitch of the note immediately, but can work it out without being given any extra information or abilities. Thus, clearly what is explicit, implicit$_1$ or implicit$_2$, is relative to and depends on the particular subject in question.

To return to the constitutive theories of content outlined earlier, I would hold that environment-based content is a description of content that characterises the totality of content, making no discrimination between implicit and explicit content. At this level of description the experiences of a subject with perfect pitch and the experiences of a subject with relative pitch would be the same. The experiences have the same content provided no distinction is made between explicit or implicit content.

What the cognitive-role based theory of content does, I would suggest, is to specify the content that is either explicit content or implicit1 content. That is, content that is immediately grasped or that can be retrieved by processing by the subject as he or she currently stands (that is without acquiring extra information or abilities). That the cognitive-role theory of content determines the explicit and implicit1 content gains support from the idea that ascribing content on this theory is a matter of looking in particular at what is or can be done by the subject or the subject's cognitive system.

I originally suggested that a cognitive-role theory of content would predict that the perfect pitch experience would have the content that a specific pitch of note, such as a middle C, was heard, while the relative pitch experience would have a less specific content. If the cognitive-role theory actually specifies the explicit and implicit1 content, then it would be in line with this theory to hold that the perfect pitch experience has the explicit content that middle C is heard. This theory would also then predict that the relative pitch experience could not contain the content that middle C was heard either explicitly or implicitly$_1$. It does, however, leave room for the content to be contained implicitly$_2$ and this matches up nicely with the predictions of the environment-based theory that content relating to a specific pitch should be present in some form. The two theories of content can, on these assumptions, be seen to be compatible and complementary.

It should be noted that the definitions of explicit and implicit content are such that they can only tell you whether a particular content of an experience is explicit, implicit$_1$ or implicit$_2$, *given that you know what the content of the experience is*. In particular, the definitions of implicit content do not allow you to figure out what content any particular experience has. They do not provide a constitutive theory of content. The environment based theory provides a specification of what the totality of content of the experience is and, given that one knows what that is, the definitions specify the manner in which that content is manifested in a given subject. To illustrate this point, consider that if an experience had the explicit content

that P and you were provided with the further information that if P then Q, one would be able to work out that Q. Based on the definition of implicit$_2$ content one might wrongly think that, on this basis alone, the content that Q was contained implicitly$_2$ in the experience. This, however, would have the plainly false consequence that all possible content would be contained in every experience. For example, if an experience had the content that P, then provided with further information that R, you would be able to work out P & R and then from that R. The definitions of explicit and implicit content therefore should be taken to indicate the nature of the content of an experience, which is specified by the environment and cognitive role based theories.

The Phenomenology of Experience and Conclusion

To what extent does the distinction between types of implicit and explicit content help us in considering the phenomenology of experience, and in particular that relating to pitch perception? I think that the proposal goes some way towards this goal. It seems plausible to claim that when a person with relative pitch hears a note they hear the pitch of the note but they do not appreciate or grasp what the pitch of the note is and this coincides well with the idea that this content is only implicit in their experience. On the other hand, the subject with perfect pitch not only hears the pitch of the note, they also appreciate or grasp just what that pitch is. The content of their experience is explicit. Furthermore, that the experiences differ, not in what the content is, but rather in how that content is manifested, helps to explain the conflicting intuitions one may feel about whether the experiences are the same or not.

In light of the nature of implicit content, I think it is clear that what implicit content an experience has will affect the phenomenology of the experience. Recall that Earle states that implicit and explicit content are, "both *phenomena*, that is they are both appearances to the subject, and not something hidden from experience altogether" (20)[20]. Further, in the case of Kluver's monkeys seeing the triangles, it seemed that, in virtue of the logical relations holding between the contents, the implicit content must feature in the phenomenology. And finally, in the case of colour perception, it would seem that when one views a shade of colour and then comes to compare it with a colour chart of shades of colour, the phenomenology associated with viewing the shade in question does not change and is precisely what allows one to compare and identify it with the labelled samples.

This conclusion, however, does not answer the question of whether an experience with an explicit content will have the same phenomenology as an experience with that content only implicitly. P.T. Brady, the only person ever to gain perfect pitch by training, attests to some difference in phenomenal character, claiming that after he had gained perfect pitch, sounds in the environment began to take on codable pitch qualities - the B-flat of refrigerator's hum, the child's pull-toy in A[21]. Further, it seems that the particular characteristics of certain musical keys can only be appreciated fully through absolute pitch[22]. These considerations, while suggesting that there may be a difference, do not prove conclusive. The first is a one-off report and further investigation would have to carried out. The second might attest

to further differences in content between the two experiences that exit in addition to the implicit/explicit difference. Thus, it remains unresolved whether the experience of a person with perfect pitch and an experience of a person with relative pitch, when hearing the same note are phenomenologically identical. One moral to be drawn here is that knowing what the contents of an experience are does not let us know a priori the nature of the phenomenology. The general representationalist thesis and particular versions of it are substantial empirical hypotheses.

To conclude, after considering hearing and pitch, it is not clear that a view of content based on visual experience can be automatically extended to cover experiences in the other sense modalities. One solution is to introduce the notions of implicit and explicit content. This not only explains and clarifies the relation between environment-based theories of content and cognitive-role based theories, but also sheds some light on the nature of both auditory and visual experiences. The existence of radically different abilities by different subjects within one sense modality is a peculiar phenomenon. Are visual experiences more like perfect or relative pitch experiences? An experience of shape might be similar to perfect pitch - I do not require a reference shape to see that a shape is a square one. As we have seen, however, experiences of shades of colour and length show that we cannot instantly grasp what shade or what magnitude is before us. The question of whether, or to what extent, our other sense modalities function like perfect or relative pitch requires further investigation. But perhaps the distinctions I have made could be usefully employed in specifying the content of experience in other sense modalities.

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Notes

[1] This view is held by, amongst others, Tye (1995), Dretske (1995) and Peacocke (1992).

[2] One author who discusses the representational nature of the direction in which sounds are heard is Evans (1982).

[3] See Moore (1989) p. 190 for the frequency of perfect pitch in the population. For an overview of the research on perfect pitch and relative pitch see Ward and Burns (1982). It should be noted that some people who only have relative pitch can sometimes uniquely identify the pitch of a note of a particular instrument. It is thought that these people have this ability in virtue of their acquaintance with the timbre of the instrument and when tested in laboratory conditions cannot make unique identifications from pitch alone.

[4] See Ward and Burns (1982).

[5] Martin (1994), McGinn (1982), Millar (1991) and Peacocke (1983) outline a view of conceptual content with regard to visual experiences along these lines

[6] Bermúdez (1995), Millar (1991), Tye (1995) and Peacocke (1992) are amongst those who postulate nonconceptual content.

[7] See Bermudez(1995)

[8] See Davis (1978) p. 134.

[9] See Ward and Edward (1982) p. 433.

[10] See Tye (1995) p. 135-137 and Dretske (1995) Chapter 2.

[11] See Tye (1995) p. 104.

[12] See Millikan (1993) Chapter 4. I am not claiming here that Millikan's account would yield the conclusion that the two states in question actually have a different content, merely that the use the states are put to is an important factor in determining the content.

[13] There is a growing literature on the difference between information that is represented explicitly and implicitly in classical and connectionist computational systems. While there is some similarity and relevance to our topic, most of the debate focuses around questions not directly relevant to this enquiry. See Dennett (1983), Kirsh (1990), Elman (1991) and Hadley (1995).

[13] Earle (1956) p. 212

[14] Earle (1956) p. 214

[15] See Harman (1990) and Tye (1995).

[16] Dretske (1993)

[17] It is essential to these cases that a good reason is given for thinking that the experience contained a content and a phenomenal character relating to the implicit content. Dennett (1991) and (1994) has questioned whether it is even appropriate to think that there is a straightforward answer to this type of question regarding the mental. This is part of a less than robust realism about the mind that includes holding that consciousness is a, 'user illusion'. I do not subscribe to this view of consciousness, and think that often strong evidence can be found one way or another. I am assuming for the whole of this paper that something like a realist representationalism that I outlined at the beginning of this paper is an accurate picture of the mind.

[17] See Hardin (1988) p. 88 and Raffmann (1995).

[18] Earle (1956) p. 214

[19] See Dowling and Harwood (1986).

[20] See Ward and Burns (1982) p. 447.