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TOWARDS AN UNHAPPY-FACE SOLUTION TO THE SORITES PARADOX

by

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This manuscript has been read and accepted for the Graduate Faculty in Philosophy in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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THE CITY UNIVERSITY OF NEW YORK

For My Parents,

Antonio and Rose Cuonzo,

Who Reasoned in the Following Way:

1) One day is not too long to support and encourage our daughter through graduate school.

2) And, for any number n, if n days is not too long to support and encourage our daughter through graduate school, then neither is $(n + 1)$ days.

3) Therefore, two thousand five hundred and fifty-five days is not too long to support and encourage our daughter through graduate school.

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Introduction

> "It is not the case that two are few and three are not also. It is not the case that these are and four are not also (and so on up to then thousand). But two are few: therefore ten thousand are also" --Diogenes Laertius, *Lives of the Philosophers*, 7.44, third century, CE.

Like all paradoxes, the sorites is best understood as an argument with seemingly true premises, employing apparently correct reasoning, with a seemingly false conclusion. Consider, for example, the following argument:

1)A person with 0 hairs on his scalp is bald.

2)For any number *n*, if a person with *n* hairs on his scalp is bald, then so too is a person with (*n* + 1) hairs on his scalp. (Inductive Premise, IP)

3) A person with 1,000,000 hairs on his scalp is bald.

The first two statements of the above argument, its premises, are very intuitive. The first, which claims that a person with no hairs is bald, describes the paradigm case of baldness. Such a premise seems unobjectionable, since if any person were to possess the property of baldness, the person with the least possible numbers of hair would. The

well. It claims that the difference of one hair is not enough to warrant the change in classification from being bald to being non-bald. For example, if a person with one hair is bald, then a person with one plus one, or two hairs, is bald as well. The conclusion of the above argument, however, seems obviously false. Notice that the number in the conclusion is somewhat arbitrarily chosen and can be increased arbitrarily. So, if one million hairs seems too small to consider the conclusion false, the number can be raised to one billion, or to however large a number is needed to make the conclusion obviously false.

In this dissertation, I argue against a prominent type of solution to the sorites paradox, what Stephen Schiffer calls "happy-face solutions" and in favor of what he dubs "unhappy-face solutions". A *happy-face solution* to a paradox does two things: first, it points to the mistake made in the formulation of a paradox; and second, it removes the air of plausibility from the mistake. An *unhappy-face solution*, on the other hand, claims that the paradox cannot be given a happy-face solution, and seeks to explain what about the relevant notions involved in the paradox causes the paradox to arise. In addition, it may or may not propose an alternative, replacement notion to the one which generates the paradox.

In Part One, which consists of two chapters, I show that the correct solution to the sorites paradox will be an unhappy-face one. In Chapter One, I (i) attempt to describe some central characteristics of vague terms, (ii) introduce the sorites paradox, (iii) give a brief explanation of unhappy-

face solutions to the paradox, and (iv) attempt to motivate the general approach of unhappy-face solutions. I claim that all approaches that respect the central features of vagueness have as a consequence that the sorites is a genuine paradox, which is unsolveable in the traditional happy-faced sense. In Chapter Two, my project is mainly negative. I survey the most prominent happy-face solutions to the paradox and argue against them.

Having shown in Part One that the successful solution will be unhappy-faced, in Part Two, I assess the major unhappy-face solutions in an attempt to find the most plausible of these. In Chapter Three I examine the solutions of Wright and Dummett, arguing that the criticisms that Wright levels against Dummett miss the mark. Dummett's position, the more thoroughly unhappy-faced one is shown to be more plausible, although there are problems with his claim that the rules which govern the use of vague terms are incoherent. In Chapter Four, I examine Terence Horgan's unhappy-faced contextualist position, comparing it with Diana Raffman's happy-faced one. I claim that Horgan's position is more successful than Raffman's, but that the success of his account turns on Dummett's incoherence thesis. In Chapter Five, I claim that it is better for the unhappy-face solution to avoid claiming, as Dummett claims, that the use of vague terms is governed by incoherent rules. A far more plausible claim is that the sorites arises due to an indeterminacy inherent in vague terms. Stephen Schiffer's position, the only one which makes such a claim,

open question whether other plausible unhappy-face solutions which appeal to the indeterminacy of vague terms could be given.

In Part Three, which consists of Chapter Six, I try to answer two main questions: (i) must the successful solution to each genuine philosophical paradox be an unhappy-faced one?; and (ii) if so, must this unhappy-face solution take the form of the kind that I argued was the successful solution to the sorites paradox? Put another way, (i) do all genuine paradoxes have unhappy-face solutions?; and, (ii) if so, does these solutions involve an indeterminacy in meaning? I focus on the skeptical paradox and the liar and try to extrapolate from these and the sorites paradox, to an account of paradoxes in general.

Part I: Groundwork

Chapter One: Vagueness, the Sorites Paradox, and Unhappy-Face Solutions

Introduction

In this introductory chapter, I (i) attempt to describe some central characteristics of vague terms, (ii) introduce the sorites paradox, (iii) give a brief explanation of unhappy-face solutions to the paradox, and (iv) attempt to motivate the general approach of unhappy-face solutions. In what follows I'll claim that all approaches that respect the central features of vagueness have as a consequence that the sorites is a genuine paradox, which does not have a standard happy-faced solution.

On What Vagueness Is

The terms "rich," "fast," "bald," "old," "heap," "red," "strong," "early," "new," "pale," "cold," and countless others, are vague. Philosophers often cite certain features of vague expressions as peculiar to them. Of the six discussed below, the first three are central features of

vague expressions, while the last three are not. In addition, there is an argument from each of the three central features of vagueness to an unhappy-face solution to the sorites paradox.

Crispin Wright has described one feature of vague terms as their "tolerance" to minor shifts in meaning, that is, "a notion of a degree of change too small to make any difference, as it were" (1987: 229). If a sedan traveling at 120 miles per hour is going fast, then a sedan traveling 119.9 miles per hour is going fast as well, since the difference of .1 miles per hour is not enough to warrant the change in classification. If someone who is able to lift 400 pounds is strong then someone who is able to lift 399 pounds and 15 ounces is strong as well, for a similar reason.

In "On the Coherence of Vague Predicates," Wright gives numerous arguments for the tolerance of vague terms. His first argument, which he says concerns color predicates (335), actually shows that all terms that are learned through ostension are tolerant to minor changes in meaning. A paraphrase of the argument is the following. It is a precondition of our being able to learn terms through ostension that we can reasonably remember what kinds of things the terms apply to. For example, it is a precondition for our being able to learn the color term "red," that we can reasonably accurately remember what the color looks like. Yet if terms that were learned through ostension we not tolerant to tiny changes in meaning, we could not remember what the color looks like well enough to learn to use the term. For example, if "red" were not tolerant to slight

counts as red, then we could not remember what "red" applies to. As Wright claims, "only if single, unmemorable changes of shade never affect the justice of a particular, basic colour description, can the senses of these predicates be explained entirely by methods reliant upon our capacity to remember how things look" (336). Therefore, terms that are learned through ostension must be tolerant to minor changes in meaning.

Wright also argues that terms that have social and moral significance are tolerant as well. Terms with social and moral significance, like "child," are tolerant, because it would be irrational and unfair to make distinctions about rights and duties on differences that are insubstantial. For example, it would be unfair to deny someone the status of adult based upon one second of age. In legal contexts where this is done, it's done with an acknowledgement of artificiality. In addition, Wright claims that without tolerance for such terms, "these predicates could no longer sustain the explanatory role which they now have for us. Only if a *substantial* change is involved in the transition from childhood to adolescence can we appeal to this transition to explain substantial alterations in patterns of behaviour" (337).

A more general argument for the tolerance of all vague terms comes from Wright's (1987) essay "Further Reflections on the Sorites Paradox." The background assumptions about natural languages and their acquisition include theses like "no distinction can mark a watershed in the conditions of application of an expression if treating it as such would standardly be

to be a misunderstanding of that expression" (1987, 233). If this is so, then no distinction could mark a watershed in the application of vague expressions, because such a distinction would be standardly taken to be a misunderstanding of these expressions. For example, someone who would say that a person who arrived at a party ten minutes after it begins is not late, but a person who arrives ten minutes and two seconds after it begins is late, it seems, does not know the standard use of the term "late". This is because it is not part of the standard use of the terms that there are such distinctions. Other background assumptions, what Wright calls the "governing view" motivate the principles as well. For example, since moral and social significance are attached to terms like "adult," distinctions too fine-grained to sustain this significance should not be made. (See Chapter Three for a more thorough discussion of the governing view).

Another, related motivation for thinking that vague terms are tolerant comes from what is sometimes referred to as the "principle of cognitive economy." The psychologist Eleanor Rosch (1977) describes the guideline below:

> As an organism, what one wishes to gain from one's categories is a great deal of information about the environment while conserving finite resources as much as possible. To categorize a stimulus means to consider it, for purposes of that categorization, not only equivalent to other stimuli in the same category

> but also different from stimuli not in that category. On the one hand, it would appear to the organism's advantage to have as many properties as possible predictable from knowing any one property, a principle that would lead to the formation of large numbers of categories with as fine discriminations between categories as possible. On the other hand, one purpose of categorization is to reduce the infinite differences among stimuli to behaviorally and cognitively usable portions. It is to the organism's advantage not to differentiate one stimulus from others when that differentiation is irrelevant to the task at hand (28-29).

Because we, as humans with limited cognitive resources, must conserve these resources as much as possible, the creation of unnecessary categories should be avoided. Keeping in mind its requirement that mental resources be conserved, cognitive economy also dictates that when the task at hand does not require that a shift in classification is necessary, then such a shift should not be made. Because humans must conserve our limited cognitive resources, unnecessary shifts in categories should be avoided.

Wright's principle of tolerance obeys the principle of cognitive economy. Cognitive economy tells us not to go around creating and

switching categories when this is unnecessary; such a creation or switch is desirable only when there is some genuine task to be accomplished. Similarly, the principle of tolerance tells us, for example, that the difference of one penny will not warrant the change in the classification of someone as rich. In other words, it tells us that one penny is not enough of a reason to warrant a change of classification. The sorites paradox arises because eventually the pennies add up to something that does warrant such a change. The principle of cognitive economy is itself vague in that it does not specify what exactly counts as meriting the creation of a new category, or the switch of classification from one category to another. However, unlike the tolerance principle, it does say that such switches are sometimes necessary.

In his essay, "Wang's Paradox," Michael Dummett describes a feature similar to that of tolerance. He calls this feature the "non-transitivity of non-discriminable differences," claiming that "the dropping of one grain of sand could not make the difference between what was not and what is a heap--not just because we have not chosen to draw a sharp line between what is and what is not a heap, but because there would be no difference which could be discerned by observation (but only by actually counting the grains)" (260). Non-discriminable difference is non-transitive, because even though one grain could not make the difference, fifty or so such grains could. If, for example, I ask someone to put a heap of salt on a plate and the person puts one grain, then he has not complied with my

one more, he has still not complied, yet by doing this repeatedly he will have done what I asked him to do. By pointing to the non-transitivity of the relation "not discriminably different," Dummett describes one striking aspect of vagueness: although there is a degree of change which makes no difference, eventually the minute degrees add up to something that does make a difference.

In giving a necessary and sufficient condition for being a borderline case, Stephen Schiffer has described another feature of vagueness as its engendering "vagueness-related partial beliefs"(1997, p. 12). In "Two Issues of Vagueness," Schiffer distinguishes between two kinds of partial beliefs, each of which are stipulatively defined in terms of subjective probability. These two types of belief are (i)standard and (ii) vagueness-related. *Standard partial beliefs* (SPB's) are the type of belief which are defined in terms of subjective probability, and can be converted into a belief about the likelihood of something being the case. Here is an example of a standard partial belief: I have a partial belief about whether my modem is the correct speed for a communications program I need. Right now, I am willing to guess that my modem's speed (2400 bps) is enough to run the program. I am, however, not completely certain. In the case of SPB's, a person who partially believes a proposition *p*, believes that *in principle* it is possible for her to get into a better epistemic position with regards to *p*, thus increasing (or decreasing) her degree of belief. Such beliefs are identified with subjective probability.

Vagueness-related partial beliefs (VPB's), on the other hand, are those which cannot be identified with subjective probability. Consider, for example, a sorites series of dollars, starting with a billion dollars and ending with one dollar, where the numbers of dollars are subtracted one by one (i.e., $1,000,000,000, to $999,999,999, ..., to $1). When confronted with such a series of dollar amounts and repeatedly asked to think about whether a person who possessed that number of dollars is wealthy, a competent speaker of the language will progress from absolutely believing that a person with that dollar amount is wealthy, to absolutely disbelieving that this is so. Yet, in the cases which are not absolute belief or disbelief, it will not be be conceptually possible for that person to make a guess about the truth of her partial beliefs. Assuming that it is possible to quantify degrees of belief, a person who believed to .6 degree that a person with four-hundred thousand dollars is wealthy does not think that he or she can get into an epistemic situation which would increase or decrease his or her degree of belief.

Where VPB's that are held in ideal epistemic positions are *paradigm VPBs*, Schiffer gives the following as a definition of a borderline case:

> x is to some extent a borderline case of "F" just in case someone could have a paradigm VPB that x is F.

In order for the above condition to be necessary, every possible borderline case, x, of "F" must be one in which someone could have a paradigm VPB that x is F. And in order for the condition to be sufficient, meeting the

condition alone must be enough to be a borderline case of *F*.

For the condition to be necessary, it need only be the case that, for each borderline case of a predicate, there is a possible world relevantly like the actual world in which a person has a paradigm vagueness-related partial belief about whether the predicate applies to the case. For example, if Pat is a borderline case of baldness, then according to this condition, there is some possible world where a person has a paradigm vagueness-related partial belief about Pat's baldness. To show the above condition to be unnecessary, someone would have to show that, for some borderline case, there is no possible world relevantly like the actual world in which someone could have a paradigm vagueness-related partial belief that the vague predicate applies to the case. In other words, someone who wants to claim that the condition is not necessary must go through all the possible borderline cases of every vague predicate and find one case in which there is no possible world where a person could have a paradigm VPB that the predicate applies to the case. I can think of no such case, and am prepared to grant that the condition is necessary.

In order for Schiffer's condition to be sufficient, meeting it alone must be enough for something to be a borderline case. There must not, that is, be a case where the condition is met, and the case is not a borderline case. I think the requirement for sufficiency can be stated thus: there must be no possible world in which someone has a vagueness-related partial belief, and that belief is not about borderline cases of vague predicates.

There is one possibility to be considered here. Consider, for example, Schiffer's own example of a precise but incompletely defined term "minor*" (p.8). A person is a minor*, if she has not reached her seventeenth birthday, and she is non-minor* if she has reached her twenty-first birthday. In the following scenario, a person who has reached her eighteenth birthday is, it seems, neither a minor* nor a non-minor*. A belief about this person's minor*hood, though, cannot be converted into one about the likelihood of her being a minor* or a non-minor*. No hidden information about the person's age would indicate whether she is or is not a minor*. Yet, as Schiffer himself noted, nothing about 'minor*' "admits of borderline cases in the intended sense" (p. 8).

To this, Schiffer may respond that a belief about whether the eighteen year-old is a minor* is not a paradigm vagueness-related partial-belief. This is because someone who knows the meaning of the term "minor*" does not partially believe that an eighteen year-old is a minor*. Consider, for example, someone who knows the term's meaning who is confronted with a sorites series of ages, progressing by minutes, from ten to twenty-five years of age. If such a person were asked to think about whether a person with the various ages is a minor*, there would be a precise point at which she would say that the person turns from being a minor* into an undefined area, and there would be a precise point later where the person would turn into a non-minor*. In the undefined region, the person has no belief about the minor*hood of the eighteen year-old, or

perhaps believes to degree 1 that the person is neither a non-minor* nor a minor*. Thus the above is not an adequate counterexample. And since I can think of no other possible counterexamples to the claim of sufficiency, I am also prepared to grant that Schiffer's condition is sufficient as well.

Up to now, three characteristics used to describe vague expressions were examined and shown to be *central* to the nature of vagueness. These features are: tolerance, non-transitivity of non-descernable difference, and vagueness-related partial beliefs. A question here arises, though, as to the feature that captures the *essence* of the phenomenon. To this question, I have no definitive answer. However, the following three characteristics, context-relativity, ambiguity, and degrees of application, are not even central to the nature of vagueness.

One purported characteristic of vagueness is that there are varying degrees to which an object is accurately described as possessing a vague property. Consider all of the terms listed at the beginning of this introduction. If each is considered a category, there are varying degrees of membership in the category. In other words, there seems to be varying degrees of wealth, speed, baldness, age, heapness, redness, strength, earliness, newness, paleness, and heat. A precise category, for example, bachelorhood, does not have degrees of membership; no two persons are both bachelors and one is more of a bachelor than the other. Yet, for a vague category such as wealth, this is not so; two persons both can be wealthy, yet one could be more wealthy than the other.

However, since it is possible in principle to have a category that admits of degrees of membership, and is yet precise, the degrees of membership in vague categories is not a sufficient condition for them. Consider the precise term *elderly**. Suppose the term is defined as applying to someone of age sixty-five, or older, and that the term admits of degrees of membership where one person can be more elderly* than another. Also suppose that a person, Edgar, is eighty years of age and another, Sadie, is sixty-five years and one minute of age. In this case, Edgar is more elderly* than Sadie, even though both are fully in the elderly* category. Moreover suppose that another person, Beatrice, is sixty-four years, eleven months, and twenty-seven days of age. Although Sadie is only a few days older than Beatrice, Sadie is elderly* and Beatrice is not. What the admittedly artificial term *elderly** shows is that even though most, or even all of the vague categories that are in used in natural languages admit of degrees of membership, nothing about degrees of membership is essential to the nature of vagueness.

Context-relativity is another often-mentioned feature of vague terms. While in one context, an object may possess a vague property, in another the very same object may not. For example, the standard for wealth for graduate students is unfortunately different from that of oil barons. So a wealthy person relative to the standard for graduate students may be non-wealthy relative to the standard set for oil barons. Similarly for the other vague terms listed at the beginning of this chapter. Standards for strength,

speed, and even heaps are context-relative: strength relative to machinery is different from strength for ninety-year old people; what is slow for an airplane is fast for a car; and a bit of dust at a construction site might be a heap on a drug dealer's table.

Yet context-relativity in this normal sense is not a central feature of vagueness. This is because even if the various contexts are sorted out, vagueness remains nevertheless. For example, even if the standard of wealth for graduate students were separated from the standard of wealth for oil barons, the vagueness as to the standard of wealth for graduate students remains as well as that relative to wealth for oil barons. There still remains a degree of tolerance as to what counts as wealth for graduate students. The subtraction of one penny from a person's wealth, for example, is not enough to warrant the change in classification from being wealthy to being non-wealthy even for graduate students[1] .

Finally, ambiguity might be thought to be a feature of vagueness. Yet whereas ambiguous statements such as "bitch" may have a finite number of precise meanings, vague terms have meanings that are imprecise. "Light" is ambiguous in that it refers to both a weight and a

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1 While it is implausible to claim that context-relativity in this normal sense is a central feature of vagueness, a more tenable position claims that vague terms are radically context-relative. Diana Raffman, for example, in "Vagueness Without Paradox," and "Vagueness and Context-Relativity," argues along these lines. The contextualist position will be discussed more fully and ultimately rejected in a later chapter.

even if the ambiguity of the term were removed by separating its various meanings, "light" would still be vague, since there are varying degrees of darkness, etc.. Vagueness and ambiguity in this normal sense are distinct[2].

In sum, while tolerance, borderline cases, and vagueness-related partial beliefs are central features of vagueness, context-relativity, ambiguity, and degrees of truth are not.

The Anatomy of the Sorites Paradox

Vague terms are famous (or infamous) for generating sorites paradoxes. In this section, I will present the sorites paradox, and, in analyzing the different parts of the paradox, show that there is no easy and immediate "solution" to the sorites.

Consider the question, "When did Ronald Reagan become old?". For each minute of his life, utterances of "Ronald Reagan is old" seem to be either true or false. At least this is what the principle of bivalence tells us. And (assuming he is old now) it follows that there is a minute in which the statement which had been previously false is true. But what minute

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2 A more plausible position claims that vague expressions are radically ambiguous, that is, that there are an indefinite number of acceptable disambiguations of a vague term. In "Vagueness, Truth, and Logic," Kit Fine claims that vagueness is "ambiguity on a grand and systematic scale." One ungenerous way of interpreting Fine's own position is to say that he holds that vagueness is radical ambiguity. In order to avoid straw man argumentation, I will avoid criticizing him along these lines. Fine's supervaluationism will be considered more carefully and eventually rejected in a later chapter.

this? If it was at the exact time he turned sixty-five, for example, then "Ronald Reagan is old" would be false one minute before he turned sixty-five. Since it is implausible to hold that Ronald Reagan was not old one minute and then old the very next, it is implausible to hold that there is any one minute in which he turned old. Thus the problem: it seems that vague sentences such as "Ronald Reagan is old" are either true or false; yet, to specify a point in minutes of a life when the sentence that was previously false is now true leads to the counterintuition that the point next to it is sufficiently different from it to warrant the change in truth-value.

The sorites paradox is best understood as an argument with seemingly true premises, employing apparently correct reasoning, with a seemingly false conclusion. Consider, for example, the following argument:

1)A person with 0 hairs on his scalp is bald.

2)For any number n, if a person with n hairs on his scalp is bald, then so too is a person with $(n + 1)$ hairs on his scalp. (Inductive Premise, IP)

3) A person with 1,000,000 hairs on his scalp is bald.

Where "B_n" stands for "A person with n hairs is bald," this is symbolized as:

1) B_0

3) $B_{1,000,000}$[3]

The first two statements of the above argument, its premises, are very intuitive. The first, which claims that a person with no hairs is bald, describes the paradigm case of baldness. Such a premise seems unobjectionable, since if any person were to possess the property of baldness, the person with the least possible numbers of hair would. Unless one is prepared to maintain that no person is bald, a position held by Peter Unger in "Why There Are No People," the first premise should be held true. As Stephen Schiffer has noted, an approach which denied the existence of bald things and people would not even enjoy a true statement. And, as Schiffer also notes, since vague expressions are ubiquitous, it follows from such a claim that there are are virtually no non-negative truths.

The second premise, hereafter called the "inductive premise," is very intuitive as well. It claims that the difference of one hair is not enough to warrant the change in classification from being bald to being non-bald. For example, if a person with one hair is bald, then a person with

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[3] With a slight alteration of the inductive premise, a sorites argument can be given starting with the premise that a person with a million hairs on his scalp is non-bald, and proving that a person with no hairs on his scalp is non-bald. The argument would be:

1) A person with a million hairs on his scalp is non-bald.

2) For every number *n*, if a person with *n* hairs on his scalp is non-bald, then a person with

(*n* - 1) hairs on his scalp is non-bald.

3) A person with 0 hairs on his scalp is non-bald.

Wright's tolerance principle; if there is a degree of change "too small to make any difference" (229), then whatever this degree could be added to the *n* in the inductive premise, so that the premise is true. Most attempts to solve the sorites paradox claim that the inductive premise is untrue, and attempt to say what it is about language that makes the premise look so plausible. The epistemic theory, for example, claims that the inductive premise is false and that (IP) seems plausible because of a conflation of our ignorance of a necessary cut-off with there being none.

And since the classical denial of (IP) is:

For some *n*, a person with *n* hairs is bald and

a person with $(n + 1)$ hairs is not bald (EP),

a solution to the paradox which claimed that (IP) is false, should either show how the above classical denial of it (hereafter EP) does not follow from its falsity, or else explain why (EP) looks so implausible. The epistemic theorist, for example, claims that (EP) does follow from (IP)'s falsity, and that (EP), although true, is initially implausible because of our essential human ignorance of *n*. Another example: Terence Horgan's transvaluationist logic distinguishes between strong and weak negation. On his system, which will be discussed in a later chapter, both (IP) and (EP) are weakly denied. So, for Horgan, the non-truth (but not falsity) of (IP) does not entail the truth of (EP). However, since as claimed above, the inductive premise follows from the principle of tolerance, those claiming that the premise is false, or even just non-true, are committed to showing that the

very forceful argument for tolerance is flawed.

Putting considerations of the truth of its two premises aside for a moment, a brief look at the reasoning used in the sorites paradox shows that, with regards to its reasoning, the sorites is straightforward . The first premise claims that a person with a specific number of hairs (0) is bald. The second premise, (IP) makes a claim about all numbers of hairs, saying that for any arbitrary number, one more or one less would not make enough of a difference to warrant a change in classification from someone's being bald to non-bald, or vice versa. The number used in premise one is plugged into the generalization in the inductive premise, to get the conclusion that a person with a million hairs is bald. However, the above formulation of the paradox need not be the only one. It would be possible to replace the inductive premise as stated above with a series of conditional statements. In this very long argument, no universal quantifier is used. Such an argument would look like:

1) A person with 0 hairs on his scalp is bald.

2) If a person with 0 hairs on his scalp is bald, then a person with 1 hair on his scalp is bald.

3) If a person with 1 hairs on his scalp is bald, then a person with 2 hairs on his scalp is bald.

4) If a person with 2 hairs on his scalp is bald, then a person with 3 hairs on his scalp is bald.

The argument would proceed in this way until the the final premise and conclusion:

> 1,000,0001) If a person with 999,999 hairs on his scalp is bald, then a person with 1,000,000 hairs on his scalp is bald.
> 1,000,002) A person with 1,000,000 hairs on his scalp is bald.

The above version of the sorites paradox uses a series of conditionals, each seemingly true, to lead to the apparently false conclusion. In this longer version of the paradox, the principle of *modus ponens* is applied repeatedly until the counterintuitive conclusion is reached.

In his essay, "Wang's Paradox," Michael Dummett considers five possible ways of taking issue with the reasoning used in the paradox. These involve claiming that: (i) the rule of universal generalization fails in the presence of vague predicates; (ii) induction fails of validity when applied to vague predicates; (iii) the rule of universal instantiation is invalid in the presence of vague predicates; (iv) modus ponens is invalid for vague predicates; and (v) although each step of the sorites argument is valid, the argument itself is not valid.

The first way of taking issue with the reasoning used in the paradox is to claim that universal generalization fails (Dummett (1975), 251). This

involves claiming that we cannot go from the truth of any arbitrary *n* in:

(a) If a person with *n* hairs is bald, then a person with ($n + 1$) hairs is bald as well.

to the truth of "For every *n*,...":

(b) For every *n*, if a person with *n* hairs is bald, then a person with ($n + 1$) hairs is bald as well.

Yet this is not a plausible way to take issue with the reasoning used in the sorites, because it would still be possible to derive for every number *n*, that a person with that number of hairs non-bald, including the number one million. According to Dummett, "this does not remove the paradox, since for each suitable interpretation of ['bald'] we can easily name a specific value of *n* for which the proposition ["A person with *n* hairs is bald'] is plainly false" (1975, 251). The paradox cannot be averted by abandoning the principle of universal generalization.

The second tactic is that of saying that the induction step fails of validity when applied to vague predicates. However, as noted above, it is possible to construct a version of the sorites paradox where the inductive premise is replaced by a series of conditional statements which gradually lead to the plainly false conclusion. So, again, it seems that calling into question induction is not a useful tactic in criticizing the reasoning used in the paradox.

Another possible way to object to the reasoning used in the sorites is to claim that universal instantiation is invalid in the presence of vague

predicates. If this is so, then we cannot reason from:

> For every *n*, if a person with *n* hairs is bald, then a person with (*n* + 1) hairs is bald.

to the statement that for each particular *m*:

> If a person with *m* hairs is bald, then a person with (*m* + 1) hairs is bald.

But to claim that this is so, according to Dummett, is a "desperate remedy" (252), since the validity of universal instantiation is constitutive of the meaning of "every." "For every *n*" means that for each particular number, something is the case. To say that this not the case is thus to neglect the meaning of "every".

Yet another possible tactic is to claim that *modus ponens* is invalid in the presence of vague predicates. Non-classical logics take such an approach. On this approach we cannot reason from:

> If a person with *m* hairs is bald, then a person with (*m* + 1) hairs is bald.

and:

> A person with *m* hairs is bald.

to:

> A person with (*m* + 1) hairs is bald.

Although non-classical logic may have a response to this, for Dummett, this is another drastic remedy, since the validity of modus ponens is constitutive of the meaning of "if". To claim that we cannot always reason from ("If P,

then Q" and "P") to "Q", is to claim that sometimes "if" does not have its usual meaning. And since the sorites is not unique in terms of its structure, it is hard to see how this is a plausible tactic.

Finally, one might argue that in the presence of vague predicates, an argument with all valid steps is not necessarily valid. However, since the term "proof" is defined as a chain of valid arguments, to claim this is to call into question the notion of proof and valid arguments. Yet another drastic remedy.

The above analysis of the parts of the sorites paradox has hopefully shown that there is no easy and immediate solution to the sorites paradox. Neither of the premises is easily shown to be false. To claim that the first premise is false involves claiming that nothing possesses a vague property. And to claim that the inductive premise is false involves showing how vagueness is not tolerant to minor changes. And as I argued earlier, this is not a plausible contention. In addition, the reasoning used in the paradox is not easily taken issue with. Thus, if I have done my job in this section, I have at least given some motivation for the view for which I shall argue, namely, that the sorites is a genuine and unresolvable paradox, at least in the standard sense.

Problems Raised by the Sorites Paradox

In "Semantic Paradoxes," Charles Chihara aptly distinguishes different problems that paradoxes raise: the "diagnostic" problem raised by a paradox is that of discerning what in our language generates the paradox. Put roughly, the diagnostic problem is that of figuring out what makes the paradox arise; in addition, the "preventative" problem is that of constructing a language or logical system in which the paradox doesn't arise, while at the same time leaving the essential aspects of the phenomenon that generates the paradox intact.

Although Chihara is primarily concerned with other paradoxes, his distinction easily applies to the sorites paradox. In this case, the diagnostic problem is that of determining what it is about vague terms that cause the sorites to arise. In addition, the preventative problem for the sorites paradox is that of constructing a system in which the paradox does not arise, usually by creating a logical system where the inductive premise is false. On the supervaluationist logic, for example, the inductive premise is false (superfalse), since each admissible specification is precise and assigns truth or falsity to even borderline cases. So, on each admissible specification the inductive premise is false, and since statements are superfalse if they are false on each admissible specification, the inductive premise is superfalse (definitely false).

One view about paradoxes claims that there can be no successful solution to the preventative problem raised by a paradox which keeps the original notion (in this case vagueness) as it is. Instead, a solution might

offer an alternative notion to the one which generates the paradox, or else claim that no alternative notion can (or need) be given. These treatments are what Stephen Schiffer has called "unhappy-face solutions" to paradoxes. In the case of the sorites paradox, unhappy-face solutions solve the diagnostic problem by identifying some feature of vagueness which causes the paradox to arise. In addition, they may (or may not) offer an alternative notion, something similar to vagueness which does not lead to paradox.

For Schiffer, unhappy-face solutions range from mild to extreme. A *mild* unhappy-face solution to the sorites paradox claims that while there can be no adequate happy-face solution, a coherent notion can be divised to replace the one which generates the paradox. For the sorites, this involves using a notion of something relevantly similar to vagueness which does not lead to paradox. An *extreme* unhappy-face solution, on the other hand, claims that no new notion can be given to replace the one involved in the paradox. To illustrate this distinction, consider, for example, a mildly unhapy-face solution to the liar paradox. Such a solution claims that there is no one part of the paradox which is flawed, but that if an alternative notion of truth is adopted, the paradox cannot arise. Such a solution, for example, might claim that although our ordinary notion of truth is problematic, if we introduce a new meta-language term, one which only can be applied to sentences in the object language, then the paradoxical liar sentences are not well-formed. If our new notion of truth is one that cannot

be applied to sentences in the meta-language, then the sentences:

'This sentence is false' iff this sentence is false.

'This sentence is not true' iff this sentence is not true.

are ill-formed. The reason for this is that the sentences refer to a sentence in the meta-language and not the object language. This is a mildly unhappy-face solution because (i) it claims that there is no real flaw in the argument as it stands, and (ii) introduces a replacement notion, in this case for truth, on which the paradox does not arise.

In "Wang's Paradox," Michael Dummett gives an extreme unhappy-face solution to the sorites paradox, one which answers the diagnostic problem by claiming that vague terms are incoherent, and that no coherent logic can be given for them. He offers no new replacement notion for vagueness, and instead suggests that such a notion couldn't be given successfully.

Schiffer (1998) explains that, unlike unhappy-face solutions,:

> A *happy-face solution* to a paradox would do two things: first, it would identify the odd-guy-out, the seemingly true proposition that isn't really true; and second, it would remove from this proposition the air of seeming truth so that we could clearly see it as the untruth it is (20, italics Schiffer's).

To remove the "air of seeming truth" from some part of the sorites paradox, a happy-face solution would (i) give an account of vagueness which is

plausible and (ii) has as a consequence that the part in question is the "odd-guy-out". The task of removing the seeming truth of a part of the sorites paradox is the preventative problem of constructing a logical system that captured the nature of vagueness, while at the same time indicating what part of the paradox is flawed.

The views discussed in this dissertation are unhappy-faced because they do not attempt to show one of the premises to be false or to question the rules of inference used. The unhappiness in such solutions lies in their precluding any traditional solution to the paradox. Below are general outlines of some arguments for unhappy-face solutions to the sorites paradox. Each type of argument, discussed more fully in later chapters, takes one of the central features of vagueness discussed in section one as a starting point.

Motivations for an Unhappy-Face Solution to the Sorites Paradox

In this section I claim that whatever of the three central features of vagueness that we choose, an unhappy-face solution follows from it. My point here is not to claim that one, or all of these three features are definitive of vagueness, but rather that the three most likely candidates for being definitive of vagueness all lead to an unhappy-face solution.

A Motivation for an Unhappy-Face Solution from Tolerance and the

Non-transitivity of Non-discernable Difference.

One of the central features of vague expressions mentioned in the first section of this chapter is their tolerance to minor shifts in meaning. If this is so, then there is no acceptable cut-off point between baldness and non-baldness in a sorites series of, for example, hairs progressing by individual hairs, from zero to one million. For, to be an acceptable cut-off, there must some reason why that point is preferable to all others. Yet the predicate "bald" is tolerant to changes of one hair, so no one point in the series could be that point. So it follows from the principle of tolerance that there is no acceptable cut-off point between baldness and non-baldness.

But, in order to be useful, predicates must apply to some objects and not to others. Any observational predicate which did not apply to any object, or applied to all objects, would be of little use to the speakers of a language. To teach the terms "red" and "bald" to novice users of the language, the experienced user points to obvious cases. This of course assumes that there are cases to which the predicates are accurately applied. And such predicates could not be learned if there were no obvious cases of things that are non-red and non-bald to be compared with. Thus it follows that there must be some cut-off between the red and the non-red, and the bald and the non-bald.

So there seems to be a tension between two assumptions that are implicit in our use of vague expressions. The first assumption is that there is no one adequate cut-off point between those things to which vague

predicates apply and those things to which vague predicates do not apply. And the second is that there must be a cut-off between the things to which such predicates apply and don't. No cut-off point is adequate, yet there must be a cut-off point somewhere. Terence Horgan has called the first assumption about the use of, or semantic rule for the use of, vague predicates the "collectivistic requirement". The second is what Horgan called the "individualistic requirement". If, as the inconsistency theorist claims, the two requirements are in conflict, then there could be no happy-face solution to the paradox; this is because a happy-face solution would not respect the inherent inconsistency of vague predicates.

Likewise, Dummett concludes that vague predicates are "intrinsically inconsistent" (264) and the sorites paradox reflects this inconsistency. "What is in error is not the principles of reasoning involved, nor, as on our earlier diagnosis, the induction step. The induction step is correct, according to the rules of the use governing vague predicates such as 'small': but these rules are themselves inconsistent, and hence the paradox. Our earlier model for the logic of vague expressions thus becomes useless: there can be no coherent such logic" (265).

A Motivation for an Unhappy-Face Solution from Vagueness-Related Partial Belief. Another of the central characteristics of vagueness is that beliefs about the borderline cases are not beliefs about the likelihood of something being the case. This type of belief (VPB), according to

Stephen Schiffer, "dubiously coheres with the assumption that borderline propositions have truth-values and with the assumption that they lack them"(21). VPB seems not to cohere with the assumption that borderline propositions lack truth-value, since VPB is a type of belief and hence concerned with truth. To partially believe some proposition is to believe to a particular degree of certainty that the proposition is true. Moreover, VPB does not seem to cohere with the assumption that borderline propositions have truth-values either, since if there were some fact about the truth-value of such a proposition then it would seem that a VPB could then be converted into a belief about the likelihood of the borderline proposition being true. That is, if borderline propositions have truth-values, then its seems that VPBs could then be converted into SPBs. But it is part of the nature of vagueness that this could not be.

One way out of this puzzle is to claim that it is indeterminate whether borderline propositions have truth-values. According to Schiffer, the competent speakers of a language may themselves have vagueness-related partial beliefs about whether or not borderline cases have truth-values. If asked whether there is fact about whether Pat, a borderline case, is bald, competent speakers may have paradigm VPBs about whether this is so. That is, they may partially believe that this is so, without thinking that one would be able to bet on whether the proposition that-Pat-is-bald is true.

For Schiffer, just as it is indeterminate whether borderline propositions are true, the inductive premise is not true, but it is

indeterminate which of the the entailments of its rejection we are required to accept. We are rationally required to reject one part of the sorites paradox, the inductive premise; yet in doing this, we are then required to either accept the classical negation of the premise, or claim that its classical negation does not follow from the untruth of the inductive premise. And neither of these seems promising. A way out of this additional puzzle is to claim that although required to reject the inductive premise, it is indeterminate which of the entailments of its rejection is untrue, since it is indeterminate whether borderline cases have truth-values.

VPB, which is essential to vagueness, will generate the sorites paradox whether or not a determinate notion of truth is adopted. This is because VPB dubiously coheres with borderline propositions having truth-values and with them not having truth-values. And since vagueness is ineliminable from the language, the paradox cannot be eliminated.

Two Minor Motivations. Although they do not necessarily show that the sorites is unresolvable, two reasons for thinking this come from the sheer length of time that paradox has gone without a definitive solution and the number of accounts that have attempted and failed to provide an adequate solution. Although it is possible there is a happy-face solution to the sorites paradox which has eluded philosophers since the time of the ancient Greeks, the sheer stubbornness of the paradox suggests that such a solution is not likely. In fact, as Schiffer has noted, most genuine

philosophical paradoxes such as the Liar and the skeptical paradox, like the sorites, remain without an adequate happy-face solution.

Conclusion

In sum, there is an argument from each of the central features of vagueness to an unhappy-face solution to the sorites paradox. Although in the first section it was left uncertain which, if either, of the two central features is essential to vagueness, in the present section I tried to show that whatever of these features is essential to the nature of vagueness, an unhappy-face solution follows from it. On the other hand, some of the characteristics I claimed to be non-central to vagueness lead to a happy-face solution: if vague expressions are claimed to be radically context-relative, then the contextualist position follows. On this position, either the inductive premise is false or else the argument is invalid; and if there are degrees of truth, then the fuzzy logic or many-valued approaches follow. What this suggests to me is that if a treatment of the sorites paradox is going to respect the inherent characteristics of vagueness, then it will be an unhappy-face solution.

Chapter Two: A Survey and Critique of Happy-Face Solutions to the Sorites Paradox

Introduction

In chapter one, I briefly outlined some positive motivations for thinking that there is an unhappy-face solution to the sorites paradox. These motivations came from: tolerance, non-transitivity of non-discriminable difference, vagueness-related partial belief, and two inductive arguments concerning the stubbornness of the paradox. In this chapter, I will argue that happy-face solutions do not do justice to the sorites paradox. Whereas, in chapter one, I mainly outlined some arguments *for* unhappy-face solutions, in the present Chapter, I give arguments *against* happy-face solutions. I try to show that each of the most prominent happy-face solutions are implausible both because they are happy-faced, and for independent reasons concerning the particular solutions. Even if I am not completely successful in this attempt, I do show at least that there is no worry-free happy-face solution. And although the main focus of this chapter is on the sorites paradox, the conclusions drawn concerning this particular paradox, I hope, can be applied to all genuine paradoxes. In the

final chapter, I outline how this might be done.

The Anatomy of a Happy-Face Solution

A *paradox* is an argument with seemingly true premises, employing apparently correct reasoning, with a seemingly false conclusion. Every *happy-face* solution to a paradox does two things: first, it identifies the part of the paradox that is mistaken; and second, it removes the air of plausibility from that part of the paradox. It is possible for the first requirement for happy-face solutions to be met and not the second. In this case, the solution would point to a part of the paradox that is mistaken but not attempt to provide a reason for thinking the part of the paradox implausible. However, it is hard to see why the second of the requirements for being a happy-face solution would be met without the first. There would be no motivation for removing the seeming truth from some part of a paradox without at the same time claiming that that part of the paradox is not true.

An *unhappy-face solution,* on the other hand, claims that no happy-face solution to the paradox can be given, and shows why this is so by appealing to the relevant features of the concepts that are used in the paradox. Such solutions claim that there is some feature about the concepts involved in the paradox that make the paradox genuine and unresolvable. Unhappy-face solutions aren't defined in terms of the classical negation of happy-face solutions. If this were so, then the only requirement for being

such a solution would be that it not meet one of the two requirements for being a happy-face solution. There is more to the unhappy-face solution than this. Such a solution explains why no happy-face solution can be given, by appealing to the concepts that are relevant to the paradox.

Many prominent solutions to the sorites paradox are happy-faced. Below, three of the most established positions on vagueness, (i) supervaluationism, (ii) fuzzy logic, and (iii) epistemicism, and their corresponding happy-face solutions to the paradox are examined.

Example One: Supervaluationism.

> "a vague sentence is true if and only if it is true for all ways of making it precise"--Kit Fine (1975, p. 265).

Supervaluationism is an account of vagueness which treats borderline cases as lacking truth-value. Put roughly, for the supervaluationist, there are cases which are clearly in the positive extension of vague term, cases which are clearly in the negative extension of a vague term, and cases which are neither clearly in the positive nor clearly in the negative extension. For this type of theorist, where Yul is clearly in the positive extension, the sentence "Yul is bald" is true; where Fabio is clearly in the negative extension, the sentence "Fabio is bald" is false; and where Harry is a borderline case of baldness, the the sentence "Harry is bald" lacks

a truth-value. The supervaluationist thus distinguishes between the two types of clear cases, and the non-clear, borderline cases.

To do this, the supervaluationist considers all possible ways of "filling in" or specifying, a vague term's meaning. For example, one way to interpret the term "bald," is to define *bald* as possessing ten thousand or fewer hairs on one's scalp. Another way is to say that a person with less than eight thousand hairs is bald. The various ways of making a vague term precise are called *interpretations* or *specifications*. By stipulation, an interpretation is *admissible* if it respects all ostensive and theoretical connections. Respect for theoretical and observational connections is needed in order to avoid conflict with experience and the specifications of other terms; for example, an interpretation that treated the term "tall" as referring to a precise height range must not make this range lower than the range it specifies for "medium height".

Supervaluationist Kit Fine terms the logical relationships such as the one between "tall" and "medium height" *penumbral connections*. There are two kinds of penumbral connections: external and internal. The just-mentioned case of the relationship between "tall" and "medium height" is an *external* penumbral connection, since such a connection concerns the extensions of two different terms. An example of an *internal* penumbral connection is the following: If Person X, who is five feet in height, is in the (positive) extension of "short," then someone who is four feet-eleven inches in height is contained in the extension as well. Whereas external penumbral

connections concern the logical relationship between two different terms, internal penumbral connections concern what types of objects are in the extension of a term, if other objects are already contained in it.

Another requirement for an admissible interpretation that some supervaluationists imply to be necessary is that the interpretation be precise. For example, the quote from Kit Fine's article "Vagueness, Truth, and Logic" which is at the beginning of this section implies that at least some supervaluationists think that in order to be admissible the interpretation must be precise. In the quote he identifies interpretations as ways of making vague sentences precise. Some supervaluationists, though, who seek to avoid problems concerning higher-order vagueness instead claim that this need not be a requirement.

The assignment of truth-values to statements based on an interpretation is a *valuation.* A *supervaluation* is the assignment of a truth-value to the statement based on all the valuations of all the admissible interpretations of the statement: a statement is *supertrue* (clearly, or definitely true) if, and only if, it is true on all admissible interpretations; a statement is *superfalse* (clearly, or definitely false) if, and only if, it is false on all admissible interpretations; and a statement is neither supertrue nor superfalse otherwise. The statements that are neither supertrue nor superfalse are nevertheless assigned truth or falsity on each admissible interpretation, so that each such statement has a value, one that varies depending on the interpretation giving the valuation. On the level of the

supervaluation, though, the statement lacks a value.

Supervaluationists sometimes use a special logical operator, the definitely operator. The definitely operator has the following truth condition:

> Def A iff "A" is true on all admissible interpretations.

For example, Harry is definitely bald if, and only if, the sentence "Harry is bald" is true on each admissible interpretation.

For the supervaluationist there are only two truth values: truth and falsity. For any admissible interpretation, all statements will be either true or false. The supervaluationist equates truth with supertruth and falsity with superfalsity. The third penumbral category, where a statement is neither supertrue nor superfalse, is not a third truth-value, but rather the absence of a truth-value; it is where no specification is given about the truth or falsity of the statement. Bivalence--which, put roughly, is the logical principle that holds that all statements are either true or false--is denied by the supervaluationist, since there will be statements which are neither true nor false. Such statements lack truth-value, even though they are true or false on each admissible interpretation. In contrast, the law of the excluded middle holds on the supervaluational account. According to the law, any statement or its denial is true. Even though some interpretations may assign truth to a statement and others may assign falsity to it, each will give it a truth-value. Each interpretation will classify "A or Not A" as true. In the

case where an assertion (A) is made concerning a borderline case, some interpretations will classify the assertion as true and others will classify it as false, so that A will be neither supertrue nor superfalse; and A's denial (Not A) will be neither supertrue nor superfalse as well. The disjunction of the two, however, will be supertrue, since every interpretation will, by stipulation, give a truth-value to the statement. So, although the disjunction of A and Not A is (super)true, neither A nor Not A are supertrue individually. Whereas in traditional two-valued classical logic a disjunction is true if, and only if, either of its disjuncts are true, on the supervaluationist logic, "A or Not A" is a (super)true disjunction without a (super)true disjunct.

The supervaluationist account gives a happy-face solution to the sorites paradox because it (a) claims that one part of the paradox, the inductive premise, is (super)false, and (b) gives an account of why the inductive premise seemed so plausible when in fact it is false. On the supervaluationist account, (IP) is (super)false, since it is superfalse that, for any number *n*,

> If someone with *n* hairs is bald, then someone with (*n* + 1) hairs is bald.

Each admissible interpretation will classify this conditional statement as false, because each admissible interpretation, being precise, will assign a precise number of hairs that will indicate whether someone is bald or non-bald. Every interpretation may have a different number, the above

conditional will be false on each of the admissible interpretations.

The supervaluationist has an interesting way of treating (IP)'s classical denial, (EP):

> There exists a number n such that a person with n hairs is bald, and a person with $(n + 1)$ hairs is non-bald.

On this account, (EP) is (super)true, since each admissible interpretation will make a sharp cut-off between baldness and non-baldness. So, for every admissible interpretation, there will be a number of hairs such that a person with that number is bald and a person with one more than that number non-bald. Yet, since this number will vary among the different interpretations, no number can be substituted into (EP) in which (EP) would be true. In borderline cases, any number that replaced the n in (EP) would be true on some interpretations and false on others. Thus, once the substitution is made, (EP) will be neither true nor false.

To describe this interesting aspect of the supervaluationist's treatment of the paradox another way: although (EP) is true, it has no witness. A "witness" is a number which could be substituted into the sentence and the sentence would be true. This feature of the supervaluationist treatment of the paradox is somewhat counterintuitive. The supervaluationist claims that there is a number n which separates the bald from the non-bald. Yet it seems a natural response to this declaration to ask which number this is. To this the supervaluationist must say that there is no one number which is the cut-off point, but that the sentence

"There is a number *n*, such that a person with *n* hairs is bald and a person with (*n* + 1) hairs is not" is true nevertheless.

For the supervaluationist, the sorites paradox is a valid argument with one true premise, one false premise (IP), and a false conclusion. The "odd-guy-out" in the sorites paradox is (IP), and the reason why (IP) looked so plausible is that, although its classical denial is true, there is no number *n* which could be substituted into the *n* in (EP), on which (EP) would be true.

Concerns for the Supervaluationist

A number of objections have been raised against the supervaluational approach to vagueness and the sorites, the most common of which are the objections concerning higher-order vagueness.

According to this type of objection, the supervaluationist cannot give a plausible account of borderline cases of borderline cases. If, for example, a supervaluationist classifies anyone with over 30,000 hairs or more as definitely not-bald, anyone with 5,000 hairs or less as definitely bald, and anyone with 5,001 to 29,999 hairs as a penumbral case, then the question arises whether the difference of one hair is enough to warrant the shift in classification from the penumbra to one of the other extensions, and vice versa. Is someone with 5,001 hairs sufficiently different from someone with someone with 5,000 hairs that the former should be considered in the penumbra while the latter should be considered in the positive extension of

bald? It seems that such a difference would be imperceptible and hence incapable of warranting the change in classification. Moreover, if the supervaluationist attempts to account for the above case by creating another penumbra between the original penumbra and the positive extension, there will still be further borderline cases between the new penumbra and the positive extension and the new penumbra and the original one. The process repeats for however many penumbra are added, and however many sets of interpretations are supervaluated over

One response to this type of objection claims that "admissible interpretation" is itself vague. There could be borderline cases of admissible interpretations, so that what counts as an admissible interpretation is supervaluated over as well. So, there are clear cases of admissible interpretations, clear cases of non-admissible interpretations, and borderline cases. One problem with this type of response as I see it concerns how this is going to get the supervaluationist a definition of truth. Assume that there are borderline cases of admissible interpretations. Given that a sentence is supertrue if and only if it is true on all admissible interpretations, we need to look to all of the interpretations to see if a sentence is supertrue or not. In this case, there are borderline cases of admissible interpretations. Do we take those borderline cases into consideration when evaluating the sentence's truth-value? What about the borderline cases of borderline cases of admissible interpretations? Since there is no clear set of admissible interpretations, there is no easy way to tell

whether a sentence is true on all of them. Here's an example: Assume that the sentence "Harrry is bald" is false on one borderline case of a borderline case of an admissible interpretation. The sentence is true on all the clear admissible interpretations and borderline admissible interpretations. Would such a sentence be neither supertrue nor superfalse? Would it be supertrue?

Perhaps the supervaluationist will say that it is supertrue when taking the clear and borderline admissible interpretations into account, but neither supertrue nor superfalse at the level of the borderline cases of borderline cases of admissible interpretations. The problem with this is that such a response implies that truth no longer is just supertruth for the supervaluationist, and that just as there are going to be different levels of borderline cases of admissible interpretations, there will be different levels of supertruth[1].

Another problem for the supervaluationist concerns her treatment of the inductive premise and its classical denial. The inductive premise is superfalse on the supervaluationist account, since, for each admissible interpretation, there is a number that marks the cut-off between baldness and non-baldness. And the classical denial of the inductive premise:

$$(E\textit{n})(B\textit{n} \,\&\, \text{-}B(\textit{n} + 1))$$

is supertrue, because each admissible interpretation has a precise cut-off point. Yet there is no number which could be substituted into the sentence

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[1] Hartry Field has given a response to the higher-order vagueness objection, one that I am still unclear on.

in which (EP) is supertrue. Since the interpretations will give different cut-off points there is no one number that can be substituted into (EP) where it would be true. Although an elegant and ingenious way of treating denial of the inductive premise, a concern here arises about the plausibility of claiming that (EP) is true although there is no number that can be substituted into it on which it is true. On the supervaluationist account it is supertrue that there is a cut-off between baldness and non-baldness, but no number of hairs could be that cut-off point.

Numerous critics of the supervaluationist treatment have claimed that the approach "does not fit very well with the way we normally understand disjunction and existential quantification" (Tappenden, 1993, p. 564). As stated above, the lack of a witness is quite counterintuitive. If a supervalutionist claims that there is some number *n* which is a cut-off between baldness and non-baldness, it is natural for us to investigate a bit further to find out what this number is. So the supervaluational treatment give a strange account of existential quantification. It's treatment of disjunction is equally counterintuitive. As noted earlier, on the supervaluational account it is possible for a disjunction to be supertrue while neither of the disjuncts are supertrue. If a supervaluationist tells us that "*p* or *q*" is true, it is natural for us to ask which one (if not both) of the disjuncts is true. To this the supervaluation must sometimes respond "neither".

To sum up: problems arise for the supervaluationist concerning the

lack of a true substitution instance into (EP) and (possibly) higher-order vagueness.

Example Two: Fuzzy Logic

Fuzzy logic, like many-valued logics, attempts to add additional values to traditional two-valued logic and semantics. According to classical logic and semantics, a concept is a function from objects to the set {0,1} where "0" represents falsity and "1" represents truth. So, for each object, a concept will map the object either to truth or to falsity. In the case of the concept "round," for example, the concept will map a basketball to truth and a computer to falsity. On the fuzzy account, however, a concept is a function from objects which takes values in the unit interval [0,1], where "0" stands for falsity and "1" stands for truth. On the fuzzy account, an object may be .7-round, instead of completely round or completely not-round (e.g., a long watermelon might fall in between complete roundness and complete non-roundness).

Kenton Machina (1976), who uses Lukasiewickz's system Lx, claims that the truth conditions for degrees of truth will obey the following table:

Table 1. Fuzzy Truth-Conditions

Let "/P/" mean "the value of."

1) /-P/ = 1 - /P/

2) /P & Q/ = Min(/P/,/Q/)

3) /P v Q/ = Max(/P/,/Q/)

4) /P --> Q/ = 1 where /Q/ > /P/; or = 1 - /P/ + /Q/

where /P/≥ /Q/

5) /(Vx)A(x)/ = the greatest lower bound of the values

/A(t)/ for each name t

6) /(Ex)A(x)/ = the least upper bound of the values /A

(t)/ for each name t

The first rule states that the truth-value of a statement's denial is determined by subtracting that value from 1. For example, if a statement is .70-true, then its denial is .30-true. An utterance of "This glass is full" is .50-true when the glass is filled halfway; and an utterance of "This glass is empty" is .50-true if the glass is filled halfway as well. In addition, the second rule states that the truth-value of a conjunction is determined by taking the minimum value of the two conjuncts. Consider the conjunction (A & B), where A is .55-true and B is .65-true. The conjunction is .55-true, since this is the lesser truth-value of the two. The third rule states that the truth-value of a disjunction is determined by taking the maximum value of its two disjuncts. Consider the disjunction (A v B), where A is .55-true and B is .65-true. The truth-value for this disjunction is .65, because this is the greater of the two numbers.

The truth-conditions for conditionals are important for the present discussion, since the inductive premise (IP) is a conditional statement.

According to the fourth rule, a conditional is completely true (i.e., has a truth-value of 1) if the consequent has a greater degree of truth than the antecedent. If, on the other hand, the antecedent has a greater value than the consequent, then the truth value of the conditional is determined by subtracting the antecedent's value from 1 and adding this to the consequent's value. Thus a conditional is true to the degree that its antecedent is false *and* its consequent true. For example, if P has a tuth-value of .60 and Q a value of .20, then the truth-value of (P --> Q) is (1 - .60) + .20, or $.60^2$.

Whereas on classical logic, a conditional (P --> Q) translates into the disjunction of the denial of its antecedent and the assertion of its consequent (~P v Q), on fuzzy logic, a conditional is true to the degree to which the antecedent is false *plus* the degree to which its consequent is true. To see why conditionals do not translate into disjunctions in fuzzy logic, consider a conditional (P --> P) where P's value is 1/2. If we could translate conditionals into disjunctions, the truth-value of this conditional would be (~P v P) which is the maximum value of the two disjuncts, which is 1/2. But this conditional it seems must be completely true, because P *must* entail P, since P necessarily has the same truth-value as itself. On this type of fuzzy logic, though, the conditional (P --> P) has the truth value 1 - /P/ + /P/, which is (1 - 1/2) + 1/2, or 1. So, on this account, this conditional is completely true.

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2 Perhaps other fuzzy logics would treat the conditional differently.

The Fuzzy Treatment of the Sorites

On the fuzzy account, the sorites starts with a completely true statement as its first premise, for example, "A man with 0 hairs is bald." Then, via a series of smaller steps of the form "If a man with n hairs is bald, then a man with $(n + 1)$ hairs is bald" (IP), a completely false conclusion is drawn. The inductive premise, on this account, has an antecedent ("A man with n hairs is bald") that is just a little more true than its consequent ("A man with $(n + 1)$ hairs is bald"). For example, the following argument uses the inductive premise:

1) A man with 0 hairs is bald.

2) If a man with 0 hairs is bald, then a man with (0+1) hairs is bald.

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3) A man 1 hairs is bald.

Since a man with no hair is more bald than a man with one hair, the antecedent of the inductive premise (premise two) is truer than the consequent. One might then conclude that the inductive premise in this argument is completely false because its consequent, although true, is not as true as its antecedent, and since the consequent of a true conditional should be at least as true as its antecedent.

However, the fuzzy logician is not so much concerned with the preservation of perfect truth as with the preservation of degrees of truth. On classical logic, the only way for an "If-then" (P -> Q) statement to be false is for the antecedent (P) to be true and the consequent (Q) false. On fuzzy logic, this definition is altered to account for degrees of truth. (See Table 1, above). In the case of premise two (above), the antecedent is completely true (1). The truth value of the consequent is almost completely true, so that second premise will have a truth value of the denial of of the antecedent (0) + the value of the consequent, which is almost 1. As the number *n* increases, the antecedent becomes less true, and hence its denial more true; also, the consequent becomes less true.

The conclusion of the above argument is not as true as the first premise. And if a further argument were constructed with the conclusion of the above argument as the first premise, then the conclusion of this new argument would be less true than its first premise and lesser true than the first premise of the above argument. After a series of such arguments, the conclusions will be almost perfectly false. As Timothy Williamson (1995) notes, "a small degree of falsity in [the sorites'] conditional premises produces a high degree of falsity in its conclusion" (124).

I'm not sure that fuzzy logic provides a "solution" to the sorites paradox, although due to the revisionist nature of the fuzzy approach it need not do so (see Edgington (1992)). A solution, it seems, would point to an untrue premise, show that the argument is invalid, or show that the

conclusion is true. Perhaps the less-than-perfect truth of the inductive premise might be used to solve the paradox. The argument's conclusion is false for the fuzzy logician, so that she cannot point to a true conclusion as a way of solving the paradox. The only tactic left, it seems, is to hold that the argument is invalid. Perhaps this is where the "solution" lies. If validity is the preservation of perfect truth, then the argument is valid. If the inductive premise and the initial premise are true, then the conclusion must be true. If, on the other hand, validity is the preservation of degree of truth, then the argument might be thought invalid, since the truth of one premise is greater than the truth of the conclusion. At any rate, fuzzy logic does not give an unhappy-face solution to the paradox, since it does not claim that paradox is unresolvable, and it does not attempt to explain how it is that the paradox cannot have a happy-face solution.

Concerns for the Fuzzy Logician

Concerns regarding fuzzy logic's treatment of some primary laws of logic are pointed out by, among others, Hans Kamp, Linda Burns, Timothy Williamson, and Rohit Parikh. For example, consider a patch that is .5-red. An utterance of "This patch is red" is .5-true. And an utterance of "This patch is not red" is .5-true as well. This is intuitive since a patch that is half-red would it seems be half-not-red as well. A question, however, arises with the utterance, "This patch is red and this patch is not red." On the

fuzzy account, an utterance of this conjunction has a truth value of .5, since the truth values of a conjunction is that of its lowest conjuncts (see Table 1, above). The truth-value of this conjunction is counterintuitive; such a conjunction seems completely false, since both a statement and its denial are being asserted. To claim that this conjunction not perfectly false is to abandon the law of noncontradiction. Moreover, on the fuzzy account, the disjunction "This patch is red or this patch is not red," would also be .5-true. This is because the truth-value of a disjunction is that of its greatest disjunct (see Table 1, above). The truth-value of this disjunction is counterintuitive, since such a disjunction is logically true, if one does not deny the law of the excluded middle.

In "Truth, Belief, and Vagueness" the fuzzy logician Kenton Machina acknowledges the counterintuitiveness of fuzzy logic's treatment of conjunctions and disjunctions such as the above. He claims:

> [I]t would seem that the most natural sort of truth-functional definitions of the connectives 'v' and '&' in our multi-valued logic are likely to result in the loss of both the law of noncontradiction and the law of the excluded middle. Indeed, this is exactly what happens in the logic for which I shall argue. I take it that the loss of these laws may seem initially to be a sufficient ground for rejecting my approach; my strategy will be to try to make the loss seem appropriate and welcome. It happens that one can give up these laws without destroying logic; in fact in a sense it even turns out that these laws are preserved in the system to be described below --although they will not always completely true, they will always be at least half-true (56-57, 1976).

Machina claims that the loss of the laws of noncontradiction and excluded middle is "appropriate" and should be welcomed, since vagueness makes it appropriate to both assert and deny a statement (1976). However, as Linda Burns has claimed in her book Vagueness (1991, p. 60), the possibility for being unreasonable would be severely limited if it is possible to both assert and deny the same statement. To assert a statement, it seems is to assert its truth, and to deny a statement is to deny its truth. The person who does both at the same time is being unreasonable, yet on fuzzy logic this person may not be unreasonable at all. It is hard to see how anyone could be unreasonable if it is possible to both assert and deny the same statement at the same time.

Another question is posed by Rohit Parikh:

> [Fuzzy logic] does not tell us why there should be *disagreements*. If someone is .5-bald, one might suppose that it would be possible to agree about *that* (italics Parikh's (1994) p.525).

In other words, in attempting to resolve disagreement and uncertainty about who should be classified as bald, the fuzzy logician merely moves the disagreement to particular degrees of baldness. There is no more agreement about .40-baldness than there is about baldness in general. In fact, there would seem to be more disagreement about .40-baldness than baldness in general.

Example Three: The Epistemic Theory.

Like the supervaluationist account, the epistemic or "vagueness as ignorance" approach holds that (IP) is false. Yet, unlike the supervaluationist, the epistemic theorist claims that there must be sharp cut-offs between the positive and negative extensions of a vague term. The epistemicist claims that our thinking that there are no such points is due to the conflation of our essential human ignorance of these cut-off's with there being none.

Taken together, two theses motivate the epistemic theory. The first is the principle of bivalence. For the epistemic theorist Timothy Williamson, a version of the principle of bivalence in which the truth-bearers are utterances holds. Roughly, the principle claims that every utterance that expresses a statement is either true or false[3] . While other approaches, such as supervaluationism and fuzzy logic, reject the principle of bivalence, the epistemic theorist claims that since contradiction results when the principle of bivalence is denied, the principle must be correct. From this it follows that every utterance, including vague utterances, is either true or false.

The second part of the motivation for the epistemic theory is really a set of independently motivated epistemic principles concerning our knowledge of borderline cases. Consider Ed, a borderline case of baldness. According to the present version of the principle of bivalence, the statement "Ed is bald" is either true or false. Yet, nothing we could do would put us in a better epistemic situation about the truth or falsity of "Ed is bald." No

[3] In his comments on Williamson's *Vagueness*, Stephen Schiffer (1997) claimsthat the epistemic theorist is committed to holding that bivalence is at the level of propositions.

amount of empirical investigation, such as counting the number of Ed's hairs and comparing it to an exact average number of hairs of the entire population, would put us in a good enough epistemic position to discern whether the sentence "Ed is bald" is true or false. Since there must be a fact of the matter about Ed's baldness and since nothing we could do would tell us what this fact is, we humans are essentially ignorant of the fact about Ed's baldness.

The epistemic theory gives a happy-face solution to the sorites paradox because it follows from the theory that the "odd-guy-out" is the inductive premise. And the plausibility of (IP) is explained as the result of the conflation of our ignorance of the necessary cut-off with there being none.

But we *do* have some knowledge of the cut-offs between baldness and non-baldness. We do know that the person with zero hairs, for example, is bald, and that the person with one million hairs is not. According to Williamson, we have inexact knowledge of the sharp cut-offs, knowledge which leaves a margin for error. Williamson gives the following principle for determining the reliability of inexact knowledge:

Margin for Error Principle: 'A' is true in all cases
similar to cases in which 'It is known that A' is true.

Here is an example of inexact knowledge and a large margin for error. Suppose that in a crowded football stadium, I wonder how many people are present. Suppose also that there are 62,927 people in the stadium. In this

case, there is no number *n*, such that I can know that there are exactly *n* people in the stadium. I cannot know this number because it would take me too long to count every person in the stadium. Yet, by stipulation, there is a precise number of people in the stadium.

According to Williamson, there are many numbers *n*, such that I can know that they are not the number of people in the stadium. For example, I can know that the number 0 is not the number, and I can also know that 20,000,000 is not the number of people. There are also many numbers *n* such that I cannot know whether these are the number of people in the stadium. I cannot, in this example, know whether 62,924 is the number of the people in the stadium. The farther away from 62,2927, the number is, the more likely that it could be in a true belief about the number of people in the stadium. Thus a belief about the number of people in the stadium is more reliable the farther away that number is from the actual number of the people in the stadium. In other words, a belief about this number is reliable insofar as I leave a large margin for error.

Williamson's margin for error principle has an interesting way of treating a particular feature of vague terms. Vague terms seem to be what Crispin Wright has called "tolerant"; that is, there seems to be a degree of change that does not make any difference in the application of a vague predicate. For, example, the application of the predicate "is bald" seems tolerant to the change of one hair. However, something that Wright does not mention is that an acceptable degree of tolerance varies at different

points in a sorites series. For example, consider a series of different amounts of money that may be possessed by a person, progressing penny by penny, from a debt of five hundred million dollars to the possession of five hundred million dollars. At the five hundred million dollar level, not only is the difference of one penny too small to make a noticeable difference, but so too is the difference of one hundred thousand dollars. A person with five hundred million dollars (5000 x one hundred thousand dollars) would not be noticeably less rich with a hundred thousand dollars less. Likewise, a person in debt for five hundred million dollars would not be noticeably less in debt with an additional hundred thousand dollars. A person with four hundred thousand dollars, however, would be noticeably less rich, and possibly no longer rich with the reduction of such an amount of money. Thus the degree of tolerance is greater at the ends of the sorites series than in the middle.

Williamson would explain this phenomenon by saying that in the case of five hundred million dollars the margin for error is quite large, so that what looks like a high degree of tolerance is allowed. All the numbers that far away from the actual number of pennies are such that knowledge of the wealth of the persons who possess this amount is extremely reliable. In the case of four hundred thousand dollars, on the other hand, the margin for error is much lower, so the reliability of beliefs about the people who possess this amount of money is much less. So, it is not the degree of tolerance that varies, but rather reliability of our beliefs.

The epistemic theorist holds that in constructing the sorites paradox, philosophers begin with a premise that is very reliably true, such as "A person with no hairs is bald"; then, via the (false) inductive premise, in which the reliability is very gradually changed, a conclusion is drawn which is very reliably false. Someone who believes that the degree of tolerant change will vary at different points in the sorites series, on the other hand, will hold that in constructing the paradox, philosophers begin with a premise where the degree of tolerant change is very high; then, via the inductive premise, a false conclusion is drawn with a high degree of tolerant change as well. For both types of theory, the degree of reliability and tolerant change are high in the first premise, and gradually reduced, until high once again in the conclusion.

A major selling point for the epistemic position is that it leaves traditional logic and semantics intact. No new conception of truth is needed, and bivalence holds. In addition, the epistemic account subscribes to a compositional truth theory and meaning theory. Thus, the epistemic position has the virtue of simplicity with regards to logic and semantics[4] .

Problems for Epistemicism

Stephen Schiffer has posed something like the following objection to

4 The type of epistemicism I just described, Williamson's, is a strong version of the view. For weaker versions, see Field (1973), (1994), McGee and McLaughlin (1995), and Paul Horwich (date). The following criticisms to epistemicism, I believe, apply equally well to the weaker versions of the view.

the epistemic position. When I utter the sentence "It's raining here" on the telephone to a friend in a far away city, I am not intending to refer to a precise location, but am rather seeking only to convey the fact that it is raining in the general vicinity. The meaning of the indexical "here," it seems, is determined by the speaker's intentions (in this case mine). On the epistemic position, though, the utterance must refer to a precise proposition which denotes an exact region in space. I am unaware of this region in space, although my utterance denotes this region anyway. But it seems that, as the speaker, I have privileged access to the meaning of my utterance. How, then, could it be that when I utter a sentence without the intention of indicating a precise region of space, I have, unbeknownst to myself, indicated such a region?

The epistemic theorist might here respond that although I did not intend to refer to a precise location, there is nothing odd in holding that the utterance did refer to a precise location. When someone utters "Pat is bald," the predicate "is bald" refers to a precise property determined by the possession of an exact number of hairs, regardless of the fact that the person who utters the sentence does not know the exact number of hairs. Likewise, when I utter "It's raining here," the term "here" refers to a precise location, even though I do not know what this precise location is.

Such a response is inadequate, however. Indexicals such as "she" and "here" have meanings that are determined by speakers' intentions. Suppose, for example, that in a situation where no singers are being

discussed, I say "She was a great singer" and nothing else. To whom the "she" refers, if anyone, is something that only I know; I have privileged access to knowledge of the referent of this indexical. The same is true of the indexical "here," which is undeniably vague. In saying "It's raining here," I may be referring the immediate vicinity, the state, or the entire country. Hence, for at least some vague expressions of the language, a speaker's intentions determines what the expressions refer to. Once this is evident, a problem for the epistemic theorist emerges: if the meaning of "here" depends on the speaker's intentions, and the speaker has no intention of indicating, or the ability to indicate a precise location, then the speaker's utterance could not have been about a precise location. But, on the epistemic account, every declarative sentence expresses a precise proposition; and a precise proposition must refer to a precise location. Hence, the proposition that-it's-raining-here must, on the epistemic account, refer to a precise location. And since this cannot be the case, due to the lack of a speaker's intention to refer to a precise region of space, there is a problem with the epistemic position.

Another response to this criticism claims that in the case of indexicals like "she" the speaker has a particular person in his or her head. This type of response is more plausible for indexicals such as "she" than it is for the demonstrative "here." Perhaps in the case of "she" we do have a particular person in mind. It is hard to imagine, though, that when we say, "It's raining here" that we intend to refer to a precise location. In addition,

this type of response does not apply to phrases like "a bit of salt." On the epistemic position such a phrase refers, unbeknownst to the speaker, to a precise amount of salt. So this type of response does not fully answer the objection.

Another objection to the epistemic position posed by Schiffer concerns human communication. In order to successfully communicate, a speaker must get her audience to understand her utterance. In order to do this, the audience must know what proposition was expressed by the utterance. On the epistemic position, there is a precise proposition that every utterance expresses. Assuming that the speaker's audience understood her utterance, then on the epistemic account, the audience could not have understood what that proposition was. But it was assumed that the audience *did* understand the speaker's utterance. Therefore, the epistemic theory cannot explain human communication.

What's Wrong In General with This Type of Solution

There are problems with the fuzzy, epistemic and supervaluationist account that are the result of their being happy-faced. Here I will focus on why they, *qua* happy-face solutions, are flawed.

One argument against happy-face solutions has the following form: Happy-face solutions take non-central features of vagueness as central to vagueness. But to do this is to give an account of some vagueness-like

phenomenon and not vagueness itself. So, to give a happy-face solution is usually to treat the paradox as one involving something similar to, but not identical with, vagueness. The most contentious assumption in the above argument is its first. Put more precisely, it claims that happy-face solutions solve the sorites paradox by: (a) pointing to a flaw in the paradox; and (b) removing the air of truth from that part by describing something similar to, but not identical with, vagueness.

Consider, for example, Raffman's contextualist and fuzzy logic treatments of the sorites. Each of these accounts takes a non-central feature as central. In "Vagueness Without Paradox," contextualist Diana Raffman treats radical context-relativity as the essential feature of vague terms. The fuzzy logic approach treats vague categories such as *bald* as admitting of a perhaps indefinite number of degrees of membership. Each of these degrees, however, are precise. Even the epistemic theorist does this, although perhaps not as explicitly as the other happy-face accounts. The epistemic theorist claims that there *must* be sharp cut-off's between the positive and negative extensions of a vague term. To her, vagueness is not a linguistic phenomenon at all, but rather a feature of us, namely our ignorance of sharp cut-off points. In effect, the epistemic theorist denies the existence of vagueness, at least as a feature of the meanings of terms.

In all of the above cases, the account takes a non-central feature as central to it.[5] Ambiguity, radical or otherwise, could not be a central

5 This is discussed more fully in the previous chapter.

feature of vagueness because eliminating ambiguity does not eliminate vagueness. Context-relativity is likewise not a central feature of vagueness, because, once the contexts of a give utterance are specified, the sorites paradox arises nevertheless. And degrees of membership in vague categories is not viable, because as with the other noncentral features, the indefinite degrees do not resolve the issue of where to draw the cut-off even among them. All of the above happy-face solutions treat vagueness as though it is precise, and based on that precision, conclude that some part of the paradox is flawed. To do this, however, is to present some vagueness-like phenomenon to replace our normal concept of vagueness, and then argue from an account of this other phenomenon that some part of the sorites is flawed.

Moreover, as briefly mentioned in the last chapter, two inductive arguments against happy-face solutions come from (i) the length of time and (ii) the effort that has been spent attempting unsuccessfully to give happy-face solutions to the paradox. Since there has been much time and effort spent trying to give a happy-face solution to the sorites paradox, all to no avail, the solution may very well be an unhappy-faced one. Although perhaps not conclusive, these arguments are more forceful than they might initially appear. If, for example, each of the happy-faced solutions in logical space have been exhausted, with no room left for happy-face solutions, then there could only be an unhappy-face solution to the sorites. Stephen Schiffer gives one tentative version of this argument:

> So I'm inclined to think, but certainly haven't shown, that none of the familiar solutions to the sorites is correct. I'm also inclined to suppose that the known views pretty much cover all the 'solutions' in logical space. If this is right, we have reached a curious impasse (1997:p.8).

For the above type of argument to conclusively show that there can be no happy-faced solution to the sorites paradox, it would have to go through all possible positions in logical space in which a happy-face solution could be given, and show that for each of these, its corresponding solution fails. However, such an argument is a partial motivation for rejecting unhappy-face solutions.

Conclusion

If the arguments presented in this part of the dissertation are successful, then there can be no successful happy-face solution to the sorites paradox. The above might then be thought to be arguments against *any* treatment of the sorites paradox. As will be shown in the next part, some views of vagueness instead attempt to give an answer to the diagnostic problem raised by the sorites paradox, without attempting to point to a flaw in some part of the sorites. Some positions on the paradox claim that it

arises due to an incoherence or indeterminacy in natural languages. For example, such accounts may give an analysis of the features of natural language that license the inductive premise. So, although prospective happy-face solutions are inadequate, there are other attempted solutions to the sorites paradox that may (or may not) be successful.

Part II: The Unhappy-Face Solutions Assessed

Having argued that the sorites paradox requires an unhappy-face solution, I here assess the unhappy-face the unhappy-face solutions that are presently in the offing. My main conclusion in this part of the dissertation concerns the kind of unhappy-face solution the sorites paradox has. I argue that the correct unhappy-face solution must avoid explaining the paradox by appealing to the incoherence of vague expressions. Instead, the solution should explain the paradox by explaining the kind of indeterminacy that leads to paradox.

Chapter Three

Dummett and Wright: Vagueness, The Governing View, and Incoherence

Introduction

Both Michael Dummett and Crispin Wright claim that given certain intuitive background assumptions concerning the rules for the use of expressions, including those regarding human perceptual limitations, the

inductive premise follows. Yet while Dummett accepts the background assumptions from which the inductive premise follows, Wright claims that since the inductive premise follows from these background assumptions, the background assumptions must be mistaken. Dummett gives an unhappy-face solution to the sorites paradox, and Wright a happy-faced one. In what follows I'll claim that Dummett's account is not open to many of the objections that Wright raises against it, and that Wright's own proposed account of vagueness and the sorites paradox is implausible. However, here I leave the matter open whether Dummett's unhappy-face solution is correct. In chapter five, I'll claim that another approach to the sorites is more fruitful.

The Governing View: The Background Assumptions that Lead to the Inductive Premise

In numerous articles (e.g., (1975), (1976), (1987)), Wright describes what he takes to be generally held and intuitive views of the nature of natural language and its acquisition. The assumptions made about natural language and its mastery, what he calls "the governing view," are divided into two general theses:

(I) The first thesis gives a necessary and sufficient condition for being a master of a language. According to this first part of the governing

view, a person is a master of a language if, and only if, that person has internalized a set of semantic and syntactic rules, definitive of the language. In order for someone to know, for example, English, that person must be aware on some level of the semantic and syntactic rules of English. As evidence of this, the person who knows English will produce utterances which obey these rules, even if the person is incapable of explicitly stating what the rules for the language are.

(II) The second part of the governing view is a collection of theses about how the rules described in (I) could be explicitly stated. These include: considerations concerning standardly accepted criteria of understanding, salient features of linguistic training, as well as speakers' known perceptual limitations. Wright calls the second part of the governing view, "its epistemological ingredient" (1987: 228). It includes among many others, the following five ideas (Wright, 1987: 232-3) for figuring out what the rules for the use of expressions are:

> (1) ...it could not be part of the understanding of an expression to be able to make unmemorable distinctions if the learning and use of the expression standardly involves no reliance on external aids of any kind.
>
> (2) ...distinctions too fine to be detected by casual observation could not be incorporated into the conditions of application of a predicate like 'bald' or

'heap' whose utility depends on being applicable on the basis of casual observation.

(3) ...the conditions of application of an expression which, like 'adult,' is associated with substantial moral and social significance, cannot incorporate distinctions too refined to sustain that significance.

(4) ...the conditions of application of any ostensively teachable expression cannot incorporate distinctions -- in particular the kind that may obtain between observationally indiscriminable items -- not amenable to ostensive display.

(5) ...no distinction can mark a watershed in the conditions of application of an expression if treating it as such would standardly be taken to be a misunderstanding of that expression.

The first, second, and fourth of these guidelines all concern the limits of human perceptive abilities. The first concerns the limited ability of humans to remember small differences among observational predicates; the second refers to humans' limited ability to detect fine distinctions on casual

observation; and the fourth concerns terms learned through ostension and observationally indistinguishable items. Each of these guidelines seems to me uncontroversial, since it is hard to see how vague terms that did not take into account the limits of human cognitive abilities could be successfully learned and applied.

However, the third guideline, which refers to the moral and social significance of terms such as "adult," is somewhat puzzling. Perhaps Wright gives such a guideline as a way of accounting for vague terms that are not purely observational. The terms "rich" and "adult" are not learned the same way as "red" or even "bald." They are more likely learned through definitions using other vague terms. A rich person is one with *a lot* of money. And an adult is *old enough* to be responsible for him- or herself. What motivates the tolerance of these expressions, then, may not be the limits of human sensory perception, but rather what Wright thinks are distinctions too fine-grained to sustain moral and social significance.

Wright's suggestion is interesting for the present discussion, because it is a claim about something other than the limits of something as straightforward as human sensory-perception. If concepts such as "adult" and "rich" have social and moral significance, and the human faculty of assigning morally and socially significant properties to a particular object is limited, then it follows that there are distinctions too fine-grained to be relevant to such terms as well. Although Wright does not explicitly make this claim, even for terms that are not purely observational, perhaps

tolerance follows from the limits of other human faculties, such as the faculty which ascribes socially and morally significant properties to objects.

Consider, for example, the following scenario. Suppose that when my nephew reaches his seventeenth birthday he wishes to come to NY to stay with me and live life on his own. It would not be rational for me to deny him my help in this endeavor simply on the grounds that he is too young, while at the same time allowing his twin who is one minute older the privilege on the grounds of that one minute of age. Although his twin has one minute more experience than he does, this difference in maturity is not something that I can discern in any outward behavior. Perhaps there is some imperceptible difference between the two young men's behavior that is due to one minute more of experience, but if there were I would not be able to discern it. Assuming that there is some extremely slight difference in the outward manifestation of the two ages, my ability to discern differences of ages is not fine-grained enough to discern this and place one age in one category and the other in a different one. So our ability to assign moral and socially significant properties to objects is not fine-grained enough to sustain slight differences. Because of this, even vague terms that not purely observational in the way that "red" is are tolerant to minor shifts in meaning.

The fifth and last of the guidelines stated by Wright concerns what would count as a "watershed" or turning point, in a sorites series. Such a point cannot be a cut-off between the positive and negative extensions of a

vague term if such a point would usually be taken to be a misunderstanding of that term. To claim, for example, that 5,678 is the cut-off point for baldness would be to violate the standard use of the term, so 5,678 could not be the cut-off point.

According to Wright, the various versions of the inductive premise follow from more than one of the above five rules for the use of vague expressions. Consider, for example, the vague predicate "red". Any or all of the first, second, fourth, and fifth of the above guidelines motivate the inductive premise using this term. If some small difference in wavelength d is not visually discriminable, and if we let k be the wavelength for the paradigm case of redness, then the following sorites paradox arises:

1) An object that reflects light of wavelength k is red.

2) For any wavelength n, if an object that reflects n is red, then an object that reflects $(n - d)$ is red.

3) Therefore, an object that reflects $(k - n^{1,000,000})$ wavelength is red.

The second premise of the above argument, its inductive premise, is motivated by considerations of the limits of the human ability to distinguish minute visual differences, as well as considerations about the normal construal of the term "red". Other versions of the inductive premises (for example, for wealth, baldness, etc.) are motivated in a similar way.

Wright concludes that given certain such plausible assumptions

about the nature of language mastery and use as (1) through (5), the inductive premise follows. If this is so, then there are two natural responses to the paradox. The first way, taken by Dummett, is to claim that the sorites paradox is genuine, and exposes an inconsistency in the (correct) rules which govern the use of vague expressions. The second way, taken by Wright, is to claim that one or both parts of the governing view are mistaken. Both are discussed below.

Dummett and the Incoherence Thesis

> What is in error is not the principles of reasoning involved, nor, as on our earlier diagnosis, the induction step. The induction step is correct, according to the rules governing vague predicates such as 'small': but these rules are themselves inconsistent, and hence the paradox. Our earlier model for the logic of vague expressions thus becomes useless: there can be no such model (1975, 256).

Of the treatments of the sorites paradox discussed in this dissertation, Michael Dummett's is the most thoroughgoing unhappy-face solution. Dummett's treatment meets neither of the two necessary conditions for being a happy-face solution; his account neither: (i) points to some flaw in

the sorites paradox, nor (ii) attempts to remove the air of plausibility from that part of the paradox. Instead, Dummett claims that vagueness is an essential feature of languages containing observational predicates, one which makes such languages inconsistent.

Dummett's main claim concerns the non-transitivity of the relation, "not discriminably different." If *a* is red, and *b* is not discriminably different from *a*, then if the relation "not discriminably different" were transitive, we must conclude that *b* is red as well. However, it is possible to give a sorites series of patches of color progressing from red to orange, where each of the patches is not noticeably different from its neighbor. In such a scenario, if the relation were transitive we would have to conclude that the orange patches are red. But by hypothesis they are orange, and hence non-red. So, the relation "not discriminably different" must be non-transitive.

Consider a scenario in which a person cannot discern anything less than the distance an object moves in four seconds. After one second, the person will not be able to tell that the object has moved from its original position, and the same is true after three seconds. But once the object has moved four seconds from its original position, the person can detect that the object has moved from its original position. However, he or she cannot tell that the object has moved from where it was one second ago, or even three seconds ago. According to Dummett, the person contradicts him or herself when attempting to describe how the object looks. The person judging the position of the object is both constrained after four seconds to judge the

present position of the object as being different from that of its original position, and yet is constrained to say the object looks to be in a different position than it was in only a second earlier, when three seconds had elapsed. But this could not be, because, by hypothesis, the person cannot judge the difference of only one second. The person judging the position of the object must therefore contradict him or herself[1] .

Dummett's concludes that (i) where non-discriminable difference is non-transitive, the use of observational predicates is intrinsically inconsistent; and that (ii) the sorites paradox reflects the inconsistency of these observational predicates. Thus, there is no solution to the sorites paradox, since such a solution would not respect the inconsistency of the rules for the use of vague expressions.

Wright's Criticisms of Dummett

In his [1987] article, Wright levels three criticisms against Dummett's position. The first questions "whether the idea of consistency can actually get any grip unless we are actually concerned with rules which have been *explicitly* codified" (235, italics Wright's). He gives the following example, meant to be analogous to Dummett's position. Suppose

1 There is a reply to Dummett's example, namely, that there is no contradiction involved in the example he gave. The judger in this situation cannot see that the object has moved, although it has. Although each second is not distinguishable, once four seconds has elapsed, the change is noticeable.

that a group of people play an inconsistently formulated game, but never notice the inconsistency, sometimes going by one rule and sometimes going by another, conflicting rule. According to Wright, a third party who was trying to discern the rules without recourse to an instruction manual would have no reason to suppose that the rules were inconsistent, but would rather suppose that two moves were permissible in the situation in question. Based on this proposed radical interpretation situation, Wright claims that only codified rules can be inconsistent. And since the rules for the use of vague expressions are not explicitly codified, Dummett's claim that the rules are inconsistent is false.

However, in "Wang's Paradox," Dummett gives the following definition of consistency (all of the italics are mine):

> 'Consistent' here means that it would be *impossible* to force someone, by appeal to rules of use that he acknowledges as correct, to contradict himself over whether the predicate applied to a given object. But, *by hypothesis*, one could force someone, faced with a sufficiently long series of objects forming a gradation from red to blue, to admit that an object which was plainly blue (and therefore not red) was red, namely where the difference in shade between each object in the series and its neighbor was not discriminable. Hence it appears that the use of any predicate which is

> taken as being governed by such a principle is *potentially inconsistent: the inconsistency fails to come to light only because the principle is never sufficiently pressed* (quoted in Keefe and Smith, 115).

Dummett's definition of "consistency" is such that Wright's criticism does not apply. "Consistency" in the present discussion refers to metaphysical inconsistency. A rule is consistent, if, and only if, there is *no possible world* in which someone is forced, "by appeal to rules of use that he acknowledged as correct, to contradict himself over whether the predicate applied to the object" (264). In the case Wright gives, the two players, by appealing to rules that are inconsistent, contradict themselves, even though they are unaware that they are doing so because the issue is of the inconsistency of the rules is not sufficiently pressed. This does not, however, preclude there being another possible world in which the issue is sufficiently pressed. For example, there is a possible world in which one player, angry that he is losing, calls the other a cheat, and appeals to the conflicting rule that the other player did not use.

Consider another more fully elaborated example, a variation of the secretary's paradox discussed in Charles Chihara's "Semantic Paradoxes." Suppose that a band of secretaries of clubs that they are not allowed to join get together and form their own club, SecLib. The only criterion for membership in SecLib is that the prospective member be a secretary of a

club that he or she is not allowed to join. Suppose as well that the club does so well that it eventually hires its own secretary, and the secretary wishes to be a member of the club. At this point, the inconsistency of the rule is made explicit: if its secretary is allowed to join, then he does not meet the sole criterion for membership; but if he is not allowed to join, then he does meet the sole criterion for membership.

As with Wright's game example, there are many possible worlds in which the inconsistency of the rule for membership in SecLib is not exposed. For example, there is a possible world in which SecLib has only a modest success and does not need to hire a secretary. In such a world, the inconsistency is not exposed. This does not, however, show that the rules are not inconsistent, for on Dummett's definition, there need only be one possible world in which the inconsistency is exposed, in order for the rule to be inconsistent. And the world in which the group hires a secretary who wants to join is such a possible world. What this (hopefully) shows is that Wright does not show that rules that have not been explicitly codified cannot be inconsistent. Given Dummett's metaphysical definition of "consistency," the Wright example does not apply. Perhaps like the secretary of SecLib, the sorites paradox points to an inconsistency that, although not usually noticed, underlies the use of vague expressions. And like the rule for membership in SecLib, the rules for the use of vague expressions need not be codified in order to be inconsistent, at least in Dummett's sense of "consistency".

Wright's second criticism points to the amount of coherence and communicative success that competent users of vague terms enjoy. According to Wright, "Dummett's response needs supplementing with an explanation of our communicative success with such vocabulary in which the idea of knowledge of inconsistent rules has an ineliminable part to play" (236). Since the speakers of natural languages have great communicative success, Dummett needs to give an account of vagueness which allows for this.

One way that Dummett might respond to Wright's second criticism is to claim that inconsistent rules are not always non-applicable. The inconsistent rule for membership in SecLib worked quite well in almost every case. No one would doubt, for example, that Murray, the secretary of the Hamptons Yacht Club who was denied membership in the HYC, is a person who is eligible for membership. It is only when the issue of the club's own secretary arises that there is any question as to whether a secretary is eligible for membership or not.

Wright's final criticism, what he calls a "decisive objection" (236) points to the fact that when presented with the sorites paradox, no one feels any less certain in their views about non-controversial cases of baldness and orangeness, etc.. Wright maintains that:

> I do not see how we can rest content with the idea that certain implicitly known semantic rules are incoherent when *nobody's* reaction, on being confronted with the

> purported demonstration of the inconsistency, i.e., the paradox -- even if they can find no fault with it -- is to lose confidence in the unique propriety of the response --e.g., "That's orange," -- which the demonstration seems to confound (236, italics Wright's).

Regardless of whether they believe the sorites paradox is fallacious, people do not believe that the justification of calling certain things "red" and others "non-red" is called into question by the paradox. Wright compares the sorites to Russell's paradox. While those who are confronted with this paradox are left with the opinion that there is no position to take until the notion of a class is made more precise, those confronted with the sorites for "red" do not feel this way: "So far from bringing us to recognize that, pending some refinement in the meaning of 'red,' there is just no such thing as justifiably describing something as 'red' or not, our conviction is that no-one *ought* to be disturbed by the paradox -- and this conviction is not based on certainty that we shall be able to disclose some simple fallacy" (236, italics Wright's).

However, Russell's paradox is more analogous to the sorites than Wright claims. I have no idea as to how to solve Russell's paradox, yet there are definitely things that I would consider classes, for example, the class of prime numbers. Similarly, someone presented with the sorites paradox might have no idea how to solve it, yet feel no compunction to

question whether, for example, the U.S. flag is red, white, and blue. Taking the secretary's paradox as another example, someone confronted with the paradox might have no idea what stand to take on it, yet still maintain that Murray, the secretary of the Hamptons Yacht Club, is an obvious case of someone who is eligible for membership. Moreover, someone might have no ready solution to the liar paradox, and yet believe that certain statements are obviously true. Thus, Wright's final criticism is unsuccessful as well.

Wright's Proposal: Knowing *How*

Wright's positive proposal for resolving the sorites paradox involves rejecting the governing view, in particular the assumption that "knowledge of the character of sorites- affected expressions is to be construed as *propositional* knowledge, acquired by immersion, and largely implicit" (237). Instead, we should think of such knowledge as similar to the knowledge of practical skills such as ice-skating and balancing. Wright claims that if we substitute this view of knowledge for the one that is the first part of the governing view, then the second part, the part which licenses the inductive premise, is no longer so "natural and harmless" (237). By questioning the background assumptions which lead to the inductive premise, Wright's strategy is to provide an account of vagueness on which the inductive premise is false, and to explain why the inductive premise is less implausible than it seems. Wright's solution is thus a happy-faced one.

According to Wright, if the first part of the governing view is rejected, then it is not implausible to see human perception as analogous to a signaling instrument for qualities like red:

> Then there ought to be the same kind of connection between an item's being red and the description to which we are prepared to assent, when appropriately placed and functioning normally in normal circumstances, as obtains between, say, an engine's operating at 4500 rpm and the reading issued by a number of correctly connected tachometers which are functioning properly and are free from external interference (244).

Just as correctly functioning tachometers will read an engine's operation at 4500 rpm if, and only if, the engine is in fact operating at 4500 rpm, the connection between an item's possessing a vague property and the description to which the competent speakers of the language are prepared to assent generates the following truth condition:

> for a particular reading to be correct is for it to be the case that the mean value of readings issued by sufficiently many appropriate instruments, which are appropriately situated, functioning properly, and free from external interference, will coincide with that

reading (244).

In the case of "red," an object is red if, and only if, there is a sufficient number of competent speakers of the language who, under normal conditions, judge that object to be red. Like the supervaluationists, Wright introduces the definitely operator as a way of distinguishing between the cases of clearly red objects, objects that are neither clearly red nor clearly non-red, and items that are clearly non-red. On this account, only those items which are judged by all competent observers to be red are definitely red. There can thus be a point where there are two adjacent patches in a sorites series where one patch is definitely red, and the other not. The patch that is not definitely red is the one where the consensus breaks down. If this is so, then the inductive premise is untrue, because there can be adjacent patches in the sorites series, where one is clearly red and the other not.

Wright's account is similar to the supervaluationist position. For the supervaluationist, a case, for example a patch of color, is no longer clearly red when at least one of the basic units for judging the case does not classify the object as being red. For the supervaluationist, the admissible interpretations are the basic judging units that are taken into consideration. On Wright's position a color patch is no longer clearly red if a "sufficient" (244) number of judging units do not classify the object as red. Both Wright's position and supervaluationism say when a cases is no longer clear by taking into consideration various interpretations. In the case of

supervaluationism, the admissible interpretations, which are ways of "filling in" a vague term's meaning are taken into consideration. For Wright, on the other hand, the responses of the competent speakers of the language are taken into account.

A Problem For Wright's Solution

Consider the competent speakers of the language in Wright's tachometer example. Each of these will give, however their responses are divided, a precise account of their own perceptions. For example, if Wright's speakers must respond to whether they are completely certain that a proposed object is red, they must answer "yes" or "no". Even if Wright's categories are separated into categories in addition to "red" and "non-red," for example, "definitely red" and "more red than not" they must in principle precisify their own responses, between say, what they think is on the border between "definitely red" and just "red". According to Wright, it is at the point in the series where any response other than "definitely red" is given, that the point no longer can be classified as definitely red. An object is definitely red if, and only if, all competent speakers of the language, in normal epistemic situations, would classify the object as red. As soon as one competent speaker no longer classifies that object as red, then the object is no longer definitely red.

Christopher Peacocke has summarized another problem with

Wright's position in the following way. It follows from Wright's tachometer analogy that the is "no difficulty in the idea of an observational predicate...definitely applying to one but not to the other of two objects which are not discriminably different in quality" (1981, 124). But, Peacocke claims, since we can't make sense of the idea of such a predicate applying to one and not the other of the indistinguishable objects, the tachometer analogy is mistaken. Peacocke's point seems to me to be that Wright's analogy does not take into account the tolerance of vague predicates. Wright claims that given the governing view, in particular the view that knowledge of predicates is knowledge of the rules for their use, tolerance follows. But since Wright rejects this part of the governing view, he is at liberty to reject tolerance as well.

Wright's response to Peacocke's objection is the following: "Undoubtedly, we can make no sense of [tolerance] if observational predicates are governed by the *rule* that they apply to both, if to either of any of observationally indistinguishable items. But that, I want to suggest, is just the misunderstanding of what an observational predicate is which the governing view encourages" (220). So Wright claims that when we give up part of the governing view, we give up tolerance. One problem with this response is that, as far as I can see, is that his replacement for the governing view itself assumes that whether a sentence is true or not is governed by rules. Wright gives a truth condition for the correctness of the "readings" in his analogy. Presumably knowing whether a reading is correct, then

involves knowing whether or not reading obeys Wright's rule for the truth of the reading. So I'm not sure that Wright has really gotten around the governing views adherence to rules.

Conclusion

In sum, Wright's discussion of the governing view and the principle of tolerance are far more successful than his proposed solution to the sorites and his criticisms of Dummett's view. Dummett's account, the unhappy-faced one, is the more successful of the two, since the background assumptions which Wright discusses, the second part of the governing view, license the inductive premise. A final verdict on Dummett's view, however, was not yet given. Once the other options are fully discussed, such a verdict will be given. Of the two accounts discussed in this Chapter, only his is an option for us.

Chapter Four

Contextualism: Happy- and Unhappy-Faced

Introduction

The present chapter concerns more sophisticated types of contextualism than the version briefly discussed in chapters one and two. In those early chapters, I claimed that context-relativity could not be a central feature of vagueness. My main reason was that even when contexts for claims about vague terms are made explicit, vagueness is not eliminated and the sorites paradox is not side-stepped. For example, even when a context for wealth is specified, as say, that relative to investment bankers, there is still an element of vagueness in the phrase "wealth for investment bankers." If a given context for wealth were specified as that for investment bankers, the difference of one dollar would not be sufficient to warrant the shift in classification from a wealthy investment banker to a non-wealthy investment banker. Moreover, the sorites paradox could still be generated for investment bankers:

1) An investment banker with ten billion dollars is

wealthy.

2) For any number *n*, if an investment banker with *n* dollars is wealthy, then so is an investment banker with (*n* -1) dollars.

3) An investment banker with no dollars is wealthy.

In addition, even if the contexts are made more and more precise, vagueness remains and the sorites paradox can still be constructed. If we use the context for unmarried investment bankers who live and work in New York, the difference of one dollar still could not intuitively mark a cut-off between wealth and non-wealth even in this highly-relativized context. Moreover, a sorites paradox for investment bankers who live and work in New York can be generated in the same way as the above paradox for investment bankers:

1) An unmarried investment banker who lives and works in New York and makes ten billion dollars is wealthy.

2) If an unmarried investment banker who lives and works in New York and makes *n* dollars is wealthy, then so is an unmarried investment banker who lives and works in New York and makes (*n* - 1) dollars.

3) An unmarried investment banker who lives and works in New York and makes no dollars is wealthy.

Even in this context the sorites is not side-stepped, and vagueness remains. From considerations such as these I concluded that context-relativity could not be a central feature of vagueness.

The present chapter concerns more sophisticated versions of contextualism than that previously discussed. Of the two types of contextualism discussed here, one gives a happy-face solution to the sorites and the other an unhappy-face one. In what follows, I'll claim that Terence Horgan's unhappy-face solution is better than Diana Raffman's happy-face solution. However, it is questionable whether Horgan should claim that vagueness is incoherent (as Dummett does). Another possibility that Horgan does not consider is that vagueness may not be a result of the incoherence of the rules governing vague expressions, but rather of an indeterminacy in meaning. So instead of supplementing an incoherence thesis, as Horgan does, his contextualist semantics could be used to supplement an indeterminacy thesis.

An Overview of Contextualism

The most important feature of these more complex types of contextualism is their claim that relevant contextual factors are left out of the formulation of the sorites paradox. For example, in her earlier essay (1994), Raffman argues that internal psychological contexts are not specified by the paradox. Once these factors are made explicit, the

argument is invalid and contains a false premise (IP). If, for example, the presentational context of the utterance were specified, so that it is made explicit whether the judger is making a single, pairwise, or threewise, etc. judgment, the argument is obviously invalid, since (IP) is a pairwise judgment and the other two statements in the sorites are single, categorial judgments. That such contexts are relevant is inferred from her independent arguments for the falsity of the inductive premise. The inductive premise is false, according to Raffman, since although there is no set cut-off between say baldness and not-baldness, every speaker eventually does make a shift in classification, a shift which depends on contextual factors such as the way the object to be judged is presented. So Raffman both argues that (IP) is false and that the argument is invalid.

Terence Horgan likewise invokes contextual factors to explain the sorites. Although he claims that the paradox shows that vagueness is logically incoherent, he argues that the nihilistic consequences that might be thought to follow from this do so only in certain rare contexts. While accepting that there are two mutually unsatisfiable semantic conditions, one which dictates that there is no cut-off between say baldness and not baldness, and the other which commands that if one some statements of the form "X is bald" are true then others are false, he contends that in the vast majority of contexts one contextually-determined semantic standard for the truth of statements of the form "X is bald" supersedes the other. In the vast majority of contexts, the standard which dictates: "if some statements of the

form 'X is bald' are true, others are false," "dominates" the other semantic requirement which claims that there is no precise cut-off point in numbers of hairs between persons who are bald and those who are not.

The contextualist account also claims that the truth-value of statements, including the premises and conclusion of the sorites, depends on the contexts in which they are uttered. On this approach, truth depends on contextually-determined semantic standards, which vary from one contextualist theory to another. Raffman, for example, implies that the psychological contexts of a competent speaker's utterance at least partly determine whether that utterance is true. Much of her early (1994) article describes the often-surprising judgments of competent speakers of English in experimental situations where subjects are subjected to a sorites series such as, for example, a series of color patches which gradually progress from red to orange. In some contexts, the subjects would judge a single patch red, while in others the same subjects would judge it orange. This, it seems to Raffman, confirms her hypothesis that the same patch can be red relative to one context, and not-red relative to another. Thus Raffman assumes that if in a particular context, the competent speakers of a language judge a statement true, then that statement *is* true, at least in the case of vague expressions. And this further assumes that the truth of statements containing vague terms is a function of whether the competent speakers of a language judge them to be true, a point which is not immediately obvious.

Horgan, like Raffman, claims that the truth-value of statements of the

form "X is bald" depends on contextually-determined standards. However, he is concerned not so much with the internal, psychological factors that affect competent speakers' judgments as with what he calls "types of discourse," where certain types of discourse employ different semantic standards than others.

Contextualism regarding the sorites paradox is instructively compared to its far more popular application to problems of epistemic justification. In fact, contextualism is often regarded as solely a doctrine about inferential justification. The *Cambridge Dictionary of Philosophy*, for example, defines "contextualism" as:

> the view that inferential justification always takes place against a background of beliefs that are themselves in no way evidentially supported....[C]laims of knowledge are justified not by ruling out any and every logically possible way in which what is asserted might be false or inadequately grounded, but by excluding especially relevant alternatives of epistemic shortcomings, these varying from one context to another (1995).

Contextualism has been used to "solve" skeptical paradoxes such as (cf. Schiffer (1996), DeRose):

> 1) I know I have hands, only if I know that I'm not a brain in a vat.

2) I don't know that I'm not a brain in a vat.

3) I don't know that I have hands.

The above argument elicits the contextualist criticism that it leaves unspecified the standards for the truth of the premises and conclusion. In certain contexts, the standards for the truth of sentences of the form "S knows that *p*" require that the speaker S knows all possible ways in which *p* might not be true, and knows all of these ways not to be the case. This is a very strict standard for the truth of such sentences. The skeptical paradox employs such a standard, since the second premise ("I don't know that I'm not a brain in a vat")employs this standard. Another, far less strict standard for the truth of statements of the form "S knows that *p*" might be that S knows and rules out all relevant alternatives to *p*'s being true. The sentence "I know I have hands," if uttered in an everyday context outside that of the paradox would employ such a standard. If the needed specifications of the standards used for the premises and conclusions are made, then we have:

1) I know that I have hands, only if I know that I'm not a brain in a vat, relative to the strict standard.

2) I don't know that I'm not a brain in a vat, relative to the strict standard.

3) I don't know that I have hands, relative to the strict standard.

The paradox dissolves, claims the contextualist, because we normally construe the conclusion of the paradox as employing the less strict standard. Once this contextually determined standard is specified, the conclusion isn't as controversial as we thought. The sentence is true, but only in quite rare contexts. Usually, the standard for the truth of the sentence "I know that I have hands" is quite less strict, so that, in those contexts, the sentence is true.

As in her solution to the skeptical paradox, the contextualist criticizes the sorites argument by claiming that some contextually-determined standard for the truth of the premises and conclusion is left unspecified. For Raffman, it is the internal psychological contexts of the speakers' utterances. For Horgan, the semantic standards for the sorites are mutually unsatisfiable, but in the vast majority of contexts, one standard supersedes the other. Just as the contextualist regarding epistemic justification tells us that, relative to a strict epistemic standard, we can't know that we have hands, Horgan's contextualism regarding the sorites tells us that, relative to maximally strict semantic standards, vagueness is logically incoherent (I'll discuss the distinction between logical coherence and logical discipline below). And just as the epistemic contextualist tells us not to worry because in less strict contexts we do know that we have hands, Horgan tells us not to worry because in most contexts one of the mutually unsatisfiable semantic standards "dominates" the other.

As will be evident shortly, the two approaches to vagueness that will

be discussed below are distinct in that the former, Raffman's, holds that the sorites paradox can be dissolved, and that vagueness is not logically incoherent, while the latter, Horgan's, claims that although vagueness is logically incoherent, the negative consequences that are supposed to follow from this do not do so in the vast majority of contexts in which vague expressions are used. Raffman proposes a happy-face solution to the sorites, claiming that the paradoxical argument is guilty of equivocation because the contexts of the premises and conclusion are not adequately stated. Once this is done, she claims, there is no paradox; classical logic and semantics are fine just the way they are. Horgan, on the other hand, proposes an unhappy-face solution of the paradox. Vagueness, on this account, is logically incoherent and the sorites is a genuine paradox in certain contexts. However, Horgan tells us, we should not despair because the unhappy consequences of this only follow in contexts where what he calls "maximally strict" semantic standards are used, as when the sorites is put forth. In the vast majority of cases though, the vagueness is benign, so that statements of the form "X is bald" have truth-values.

Raffman's Homuncular View

Like the supervaluationist and epistemic accounts, Raffman attempts to solve the sorites by objecting to (IP), the assumption that the difference of one hair, or grain, is too small to justify a difference in the classification of

something as bald, or of something as a heap. In "Vagueness without Paradox," Raffman first attempts to give a solution to the sorites by considering a version where the conclusion that is drawn is that the person that has a million hairs "looks bald." Once this is accomplished, she applies the solution to versions of the paradox where the conclusion is that the person with one million hairs "is bald." Consider, for example, the following argument:

1) Someone with 1 hair on his scalp looks bald.
2) If someone with n hairs on his scalp looks bald, then someone with $(n + 1)$ hairs on his scalp looks bald as well.
3) Someone with a million hairs on his head looks bald.

In this way, a paradoxical argument has been generated for looking bald and not being bald. Raffman hopes to find the solution to the paradox in its more famous form by first solving the paradox in the above form.

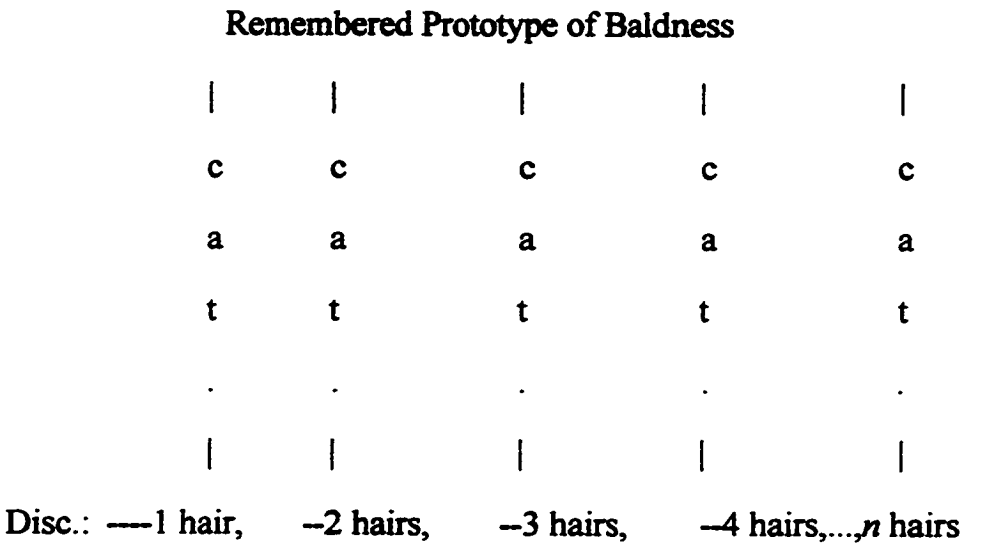
To do this, she argues that a distinction must be made between two separate homunculi, or judging faculties: (1) a categorizer, and (2) a discriminator. Judged singly, heads differing by only one hair may be judged differently, one as bald and the other as not-bald. In this case, the judger is categorizing the different heads relative to some prototype of baldness that the judger remembers. Judged pairwise, however, the judger will always classify the two heads together. This is because the

discriminator, the faculty which makes same/different judgments, will classify the two heads as the same or very similar.

Raffman describes the "structural" (1994:48) difference between the two homunculi in the following way:

> Invoking a spatial metaphor, we can envision two kinds of judgments as orthogonal to one another, with the discriminatory judgments represented horizontally as between adjacent patches, and the categorial judgments represented vertically as between each patch and the stored prototype (1994:48).

Although Raffman does not give one, a diagram expresses her point well:



Raffman claims, "The discriminator has no memory to speak of, and certainly no memory of the sort required for categorial distinctions." Whereas the categorizer makes a comparison between the case at hand and some remembered prototype, the discriminator does not discern the progressive changes as s/he compares each point in the sorites sequence. Raffman explains:

> We might capture the idea by envisioning the category as a kind of mental elastic band anchored at one end to the stored prototype; the categorizer's job would then be to try to stretch the band far enough to embrace a given [case] (1994:49).

It we take baldness as an example of such a category, then eventually a point will be reached where the category will no longer be able to "stretch out" to "embrace" a particular point on the sorites sequence. Thus there will be a point where the difference of one hair will separate a bald person from one who is not bald. This is a matter of brute mechanical fact, according to Raffman, a matter which will vary depending on multiple "testings" of the transition points in a sorites sequence. In other words, different runs of a sorites experiment where, for example, a person with an unquestionably full head of hairs has all the hairs removed one at a time, will result in different transition points in the sorites sequence.

According to Raffman, there is a hidden equivocation in the paradoxical argument. One premise describes a situation where someone with one hair looks bald when judged singly. That is, the first premise describes a categorial judgment. The inductive premise, on the other hand, describes pairwise judgments, since the premise describes the difference between two adjacent points in a sorites sequence. The inductive premise then describes a discriminatory judgment. Finally, the conclusion in the paradoxical argument describes a situation where a person with one million hairs is judged singly to be bald. The conclusion then is a categorial judgment. Once the distinction between types of judgments is made, the argument is:

1) A person with one hair, judged singly, looks bald.
2) For any n, if a person with n hairs looks bald, then, a person with $(n + 1)$ hairs looks bald, insofar as n and $(n + 1)$ are judged pairwise.
3) Therefore, someone with a million hairs looks bald.

Once the two separate types of judgment are explicitly stated, the conclusion does not follow. The argument is invalid.

Raffman's solution to sorites paradox for "looks bald," however,

invites a criticism that will be shown later to be of concern for her later attempt to solve the sorites for "is bald." It seems that the paradox for "looks bald" has not been solved, since it is possible to construct a paradoxical argument very similar to Raffman's own, where the type of judgment (i.e., categorial or discriminatory) remains constant. Consider for example, the following argument:

> (1) A person with one hair, when judged pairwise with a person with no hairs, looks bald.
>
> (2) For any n, if a person with n hairs looks bald, then a person with $(n + 1)$ hairs looks bald, insofar as the persons with n and $(n + 1)$ hairs are judged pairwise.
>
> (3) Therefore, someone with a million hairs looks bald when judged pairwise with someone with 999,999 hairs.

Here the type of judgment remains fixed, so that both premises and the conclusion describe pairwise judgments. Yet, a paradox arises nevertheless: the two premises are very plausible, and presumably true, the argument is valid, and yet the conclusion is obviously false. Thus, it seems that Raffman's attempt to solve the paradox for "looks bald" by appealing to different types of judgment cannot work.

Raffman attempts to solve the sorites for "is bald" in a way very similar to her method for solving the paradox for "looks bald." She claims

that vague predicates such as "bald," "rich," and "red" are context relative. A person with one million dollars may be both rich and not-rich, relative to the respective standards of the South Bronx and Beverly Hills. Even in the case of "red," subjects may vary in their judging patches the color red, so the same patch may be judged red relative to one subject or context, and not-red relative to others (1994: 64).

Raffman claims that the extension of a vague predicate varies with its presentational, historical, and categorial contexts: the *presentational* context varies depending on whether items are being judged singly, pairwise, threewise, etc.; the *historical* context varies depending upon how an item has been previously judged (e.g., a person with a million dollars might be judged repeatedly rich relative to some judgmental histories, not-rich relative to others); finally, the *categorial* context varies because of the "brute mechanical variations in the operation of our categorizing homunculus: as a matter of psychological fact, our categorizer just gets tired, or bored and so shifts to a new elastic band, at different places and on different places and on different runs [of a sorites experiment]" (1994: 65). The above contexts are what she calls "psychological" or "internal."

Once psychological contexts in a given judgment are made explicit, the paradox dissolves, according to Raffman. The sorites for "is bald," like its "looks bald" counterpart, is guilty of an equivocation:

(1) Someone with 1 hair is bald, relative to a singular presentational context (and any given

historical and categorial contexts).

(2) For any *n*, if someone with n hairs is bald then someone with (*n* + 1) hairs is bald as well, relative to a pairwise presentational context (and any given historical and categorial contexts).

(3) Therefore, someone with a million hairs is bald, relative to a singular presentational context (and any given historical and categorial context).

Raffman claims that the paradoxical argument is rendered invalid when the variance in presentational context is made explicit. For the argument to be valid, the second premise (IP*) would have to be altered to the false premise "For any *n*, if someone with *n* hairs is bald, relative to a singular presentational context (and any given historical and categorial contexts), then someone with (*n* + 1) hairs is bald as well, relative to a singular presentational context (and any given historical and categorial contexts)" (IP). However, IP was shown to be false by Raffman's earlier arguments for the distinction between different contextual factors involved in judgments and her still earlier arguments for the distinction between categorial and discriminatory judgments. These arguments showed that the difference of one hair, grain, etc. *was* sufficient to license a shift in categories. For the above argument's second premise to be true, it must be IP*, but if IP* replaces IP, the argument is invalid with true premises. Since

a paradoxical argument must be valid and have true premises and a false conclusion, in either case, the argument is not a paradox.

However, the same criticism that I raised for Raffman's solution to the sorites for "looks bald" can be raised for her solution to its "is bald" counterpart. It is possible to construct a sorites argument where the presentational, categorial, historical, and all other contexts are fixed. For example, consider the following argument:

> (1) For any number *n*, someone with *n* hair is bald, relative to a pairwise presentational context, then someone with (*n* + 1) hairs is bald, relative to the same context.
> (2) A person with one hair is bald relative to a pairwise presentational context, compared to a person with no hairs.
> (3) Therefore, a person with a million hairs is bald, relative to a pairwise presentational context, compared to a person with 999,999 hairs.

Even the presentational context is kept fixed, a paradox arises, since eventually a slight shift in pairwise judgments will result in a shift in classification. Both premises in the above argument are presumably true, the conclusion false, and the argument valid. Yet each of the premises and the conclusion leave the presentational, categorial, and historical contexts

fixed. Thus the paradox re-emerges.

In her later article, "Vagueness and Context-Relativity," Raffman rightly drops the categorial/discriminatory distinction from her discussion, although she keeps the homuncular metaphor. In this later work, the homunculi are different categories rather than categorizers and discriminators. Consider the subjects in an experiment who are presented a sorites series, with fifty marginally different patches of color progressing from a clear case of red to a clear case of orange. These subjects are asked to go through the series and state the color of each of the patches. In this experimental situation, two homunculi will be isolated: the categories Red and Orange. Eventually every subject will shift his or her response from "red" to "orange". Yet the point of this switch will differ on different runs of the sorites series. Depending on whether the patches shown progress from red to orange or orange to red, the subject will judge more of the patches red or more of them orange. For example, if the clear case of orange is shown first, the subjects will try to classify as many possible patches as they can as orange. And if the clearly red patch is shown first, then the subjects will classify many more of the marginal cases as red.

Why does this occur? Raffman posits that the two different categories, like the gears in a transmission, if presently in use tend to stay in use as long as possible before the shift of categories is made. And we, like the people who drive cars with (good) automatic transmissions, don't perceive the shift that has taken place, but rather think of the changes in

speed as continuous. Just as the changes in gear take place at a level that is imperceptible to the driver, the category changes that take place in the sorites sequence do so on a subpersonal level. Eventually, there is a gestalt-like switch where the colors are seen as belonging to different categories, but this switch varies depending upon such factors as which of the two homunculi is presently favored. Thus, many of the patches in this series can be "seen as" red *or* "seen as" orange; which of the two is "seen" depends on which is presented first.

There is much to be said for Raffman's account of the gestalt-like shift between categories. Raffman's account adheres to one of the most important principles of categorization, that of cognitive economy, which claims that because humans must conserve our limited cognitive resources, unnecessary shifts in categories should be avoided. Thus, the subjects in the experiment placed more patches in the same category as the clear case that they were first shown.

Raffman in this later article argues that the inductive premise is false, because eventually a shift must occur, although not always at the same point in the sorites series. While there is no set cut-off point between, e.g., baldness and non-baldness, like the gears of the automatic transmission, there comes a point where the category must be switched. Eventually, then, and perhaps imperceptibly, the difference of one hair will prompt a shift in the classification of someone as bald. The inductive premise, which holds that the difference of one hair cannot warrant such a shift, is thus false.

However, one *prima facie* problem for this type of approach to the sorites paradox emerges: other accounts which claim that the inductive premise is false can account for the types of phenonomena that Raffman describes, as well as for the context-relativity of vague terms. The epistemic theorist, for example, can and should claim that whatever sharp boundary there is between baldness and non-baldness is relativized to a particular context. The contexts that Raffman describes may play a role in determining which point the cut-off is, but the cut-off itself will be unknowable. So it is at least initially unclear whether Raffman's account is incompatible with the epistemic theory.

Another problem: unlike other accounts, Raffman claims that once vagueness is reduced to something happening on a "subpersonal level" it dissolves. Like our perceptions of the shifting of the gears of a good automatic transmission, the boundaries of vague concepts appear to have a smooth and gradual fading away, when in fact the changes of categories are more blunt. One initial problem with this view of vagueness is that it seems to treat vagueness as a perceptual illusion.

Horgan's Transvaluationism

Whereas Raffman argues that the sorites paradox can be solved, leaving classical logic and semantics intact, Terence Horgan, in "Transvaluationism: A Dionysian Approach to Vagueness," argues that

vagueness is logically incoherent, although benign, and that classical, referential semantics must be jettisoned in favor of what he has previously called "psychologistic semantics," but now refers to as "contextual semantics." Horgan uses his account of contextual semantics to argue for transvaluationism, a two-part theory containing an incoherence thesis and a legitimacy thesis; the incoherence thesis holds that vagueness is logically incoherent, while the legitimacy thesis claims that vagueness is "benign, beneficial, and essential" (1994: 97).

In order to understand Horgan's account of vagueness fully, it will first be necessary to become acquainted with his contextual semantics; for it is his semantics that is the basis of his treatment of vagueness and the sorites. Contextual semantics, according to Horgan, is intermediate between two views: referentialism and neo-pragmatism. While the former holds that truth is a direct correspondence between language and the world, the latter holds truth to be epistemic in the sense that it is either warranted, ideal, or super- assertibility. Contextual semantics, in contrast, equates truth with correct assertibility. The semantic concepts of truth and falsity, on the contextual account, are normative in the sense that truth is correct assertibility and falsity is correct deniability. Thus, contextual semantics is distinct from neo-pragmatism in that it holds that truth as a semantic concept is not epistemically normative.

The contextualness in contextual semantics lies in its assertion that the standards for correct assertibility are not, according to Horgan,

"monolithic within language; instead they vary from one context to another, depending upon the specific purposes our discourse is serving at the time" (1994: 100). Assertibility standards vary not only from one "mode of discourse" to another, but also within any mode of discourse. (I take Horgan to mean by "mode of discourse," something similar to Wittgenstein's notion of a language-game).

Although standards for assertibility often vary depending on context, correct assertibility is normally a product of two factors, according to Horgan:

(F1): The relevant assertibility norms.

(F2): How things actually are in THE WORLD.

Following Putnam and Horgan, I will indicate that I am referring to things in the mind-independent, discourse-independent world by using upper-case letters. Semantic standards are "maximally strict" if they have the following feature: "under these norms a sentence counts as correctly assertible (i.e., as true) only if there are OBJECTS and PROPERTIES in THE WORLD answering to each of the sentence's constituent single terms, constituent assertoric existential quantifications, and constituent predicates" (1994: 100).

According to contextual semantics, and contra referentialism, our discourse often employs standards of truth that are not maximally strict. In other words, even though correct assertibility (truth) does typically depend upon the way things are in THE WORLD (F1), in many instances this

dependence is not a direct correspondence between language and THE WORLD. Although there are cases when semantic standards are maximally strict, for example, the case of sentences which make serious ontological claims, there are are also times when the semantic standards (F2) alone sanction the correct assertibility of a sentence. An example of this might be the sentences of pure mathematics. The correct assertibility of most sentences, however, depends on a combination of both (F1) and (F2), so that the correct assertibility of the sentence depends on both OBJECTS and PROPERTIES in THE WORLD and the relevant assertibility norms. Horgan gives the following sentence as an example of this most common case:

(B) Beethoven's fifth symphony has four movements.

The correct assertibility of the above sentence probably does not require that there be some ENTITIES in THE WORLD which corresponds to the phrases "Beethoven's fifth symphony" and "has four movements." Instead, the sentence correspond to THE WORLD in a more indirect way, for example, through the behavior of Beethoven.

If Horgan's view is correct, and truth is intimately bound up with assertibility norms, then meaning, too, is intimately connected to these norms. As he writes:

> Intuitively and pretheoretically, meaning is what combines with how THE WORLD is to yield truth. Thus, if truth is correct assertibility under operative assertibility

> norms, then the role of meaning is played *by the assertibility norms themselves* (1994: 102).

If Horgan is correct in his above assertion, then questions about meaning are, to a large extent, questions about operative assertibility norms. According to Horgan, whether or not an assertibility norm is an operative one, in a given context of discourse, depends on the truth-judging and falsity-judging dispositions of competent speakers. These dispositions are psychological, although contextually-attuned and socially-coordinated.

Contextual Semantics, Vagueness and the Sorites

Horgan uses contextual semantics to give an account of vagueness in the following way. Remember that earlier he made a distinction between, on the one hand, semantic standards that maximally strict, such as those that are operative for sentences which make serious ontological claims, and, on the other, those which are not maximally strict. Remember also that it is relatively rare that the semantic standards for the truth of a sentence in a given mode of discourse are maximally strict. Although vagueness, according to Horgan, is logically incoherent, the nihilistic consequences that are thought to follow from this do so only for discourse in which the semantic standards are maximally strict. In the far more common contexts in which vague expressions are used, the semantic standards work together

in such a way that,

> (1) certain statements that make vague expressions are true and others are false (correctly assertible and correctly deniable); (2) the underlying logical incoherence gets quarantined rather than exerting a malignant effect on language and thought (as I put it below, vagueness sanctioning discourse is logically *disciplined*, even though it is not logically incoherent); (3) sorites arguments are effectively blockable; and (4)...the very feature of vagueness that largely generates its benifits--a feature I call robustness--is also the feature that also harbors its incoherence (1994: 106).

It will be necessary to examine each of these separately. I will begin with the last. Horgan defines "robustness" as the "the idea that there is no precise fact of the matter about semantic transitions among the respective statements in a sorites sequence" (1994: 106). This does not mean merely that there is no precise point where statements turn from true to false, but rather that there are no precise transition points at all on a sorites sequence. Thus there is no precise transition point between truth and non-truth, falsity and non-falsity, or even degrees of truth. Robustness follows from the tolerance of vague terms, since if vague terms were not robust, then for

some points in a sorites series, there would not be a degree of change too small to make a differnce in the correct application of the term. And if robustness is, as Horgan thinks, an essential feature of vagueness, then both the many-valued and supervaluationist approaches are inadequate. Both supervaluationism and many-valued logics hold that while there may be no precise transition point between truth and falsity, there are precise transition points, in the case of supervaluationism, between truth and the penumbra and falsity and the penumbra, and in the case of many-valued logic, between degrees of truth.

Not only is vagueness essentially robust, it is also discriminatory in that if some statements in a typical sorites sequence are true, then others are false. In contrast to the above *individualistic* robustness standard, this discriminatory requirement is instead *collectivistic*. Every sorites argument begins with a statement that is blatantly true, such as the statement "A person with one hair is bald" and ends (via the inductive premise) with a statement that is obviously false, such as "A person with a million hairs is bald."

Horgan argues that both features are incompatible, since they jointly generate semantic requirements that cannot be satisfied if any of the statements in the sorites is true. The robustness condition holds that there is no semantic fact of the matter about the transition points between the sentences in a sorites sequence. Yet, if there are true sentences in a sorites sequence, then by the discriminatory requirement, there also must be false

ones. But this implies that there is such a transition point. Thus the only way to avoid violating one of the two requirements is to assign falsity to every statement in the sorites sequence. From this Horgan concludes that vagueness is logically incoherent in that two operative semantic standards regarding vagueness cannot be mutually satisfied, except by holding that every statement in a sorites sequence is false.

The conclusion that vagueness is logically incoherent may seem undesirable, especially since so much of actual discourse is vague. Yet, Horgan tells us, we should not despair because although vagueness is logically incoherent, it is also logically *disciplined*. While there are two semantic requirements that cannot be mutually satisfied in vague discourse, one of these requirements will semantically *dominate* the other without defeating it.

According to Horgan, vagueness is logically incoherent in the following way: "It is not possible for the statements in a typical sorites sequence to fully satisfy, in such a way that some of these statements are true, the semantic requirements imposed by the robustness and the discriminatoriness of vagueness" (108). Horgan claims that "vagueness-sactioning discourse is logically incoherent in the following way: the contextually operative semantic standards impose, on the statements in a typical sorites sequence, semantic requirements that cannot be mutually satisfied? (109). In other words, there are two mutually unsatisfiable requirements for the correct use of vague terms, one being that some

statements about borderline cases are true (discriminatory requirement), the other being that there is no one place in a sorites series of statements about borderline cases where statements can switch from being true to being non-true (robustness requirement.)

Horgan claims, though, that vagueness is logically disciplined in that one semantic requirement, the discriminatory requirement, usually is the one to get satisfied. Only when both requirements are made explicit is the logical incoherence of vague expressions exposed.

As an analogy, Horgan asks us to imagine two conflicting moral obligations, where one would dominate the other without defeating it. Consider an established, tenured philosopher who has promised to write a letter of support for another philosopher who is seeking tenure. She then promises to present a paper at an important conference, without realizing that time restrictions make it impossible for her to both write the letter and present the paper. In this case, the philosopher faces a genuine moral dilemma. She has made two promises that cannot be mutually fulfilled, and neither is easily revoked. Neither promise morally defeats the other, yet one--the promise to write the letter of support--dominates the other.

Just as two moral requirements may be mutually unsatisfiable, two semantic requirements may be mutually unsatisfiable as well. In typical contexts of vague discourse, the collectivistic discriminatory requirement dominates the individualistic robustness requirement. Truth, then, is correct assertibility under semantically dominant, contextually operative,

semantic standards. If this definition is correct, then some statements containing vague predications are indeed true.

But what makes one semantic standard dominate another? Horgan holds that pragmatic factors are behind the dominance relation, "factors involving the point and purpose of vagueness in our language and thought" (1994: 111). If the individualistic requirement were dominant, the statements of the form "P and not P' would turn out true, when P is vague. So, although vagueness is logically incoherent, it is semantically and logically disciplined: semantically disciplined in that there are semantic dominance relations among nondefeasible, mutually unsatisfiable semantic requirements, and logically in that it is semantically disciplined (i.e., truth conforms to determinate logical principles). Horgan calls his view "sado-semantics."

At this point, one might think that Horgan has said all that he needs about the sorites: the paradox shows that vague discourse is logically incoherent, but we should not despair because, usually, the collectivistic requirement dominates the individualistic one. Horgan's view has certain advantages over Raffman's view. First, it gives an unhappy-face solution to the sorites paradox. And relatedly, it does not treat vagueness as some sort of perceptual illusion.

Horgan, however, feels the need to show how the sorites is "blockable"(1994:106), by appealing to his transvaluationist logic. Transvaluationist logic introduces two types of negation, a strong and a

weak, in an attempt to reconcile the two competing semantic standards: robustness and discrimination. However, a question here arises as to why Horgan needs to introduce transvaluationist logic in order to "solve" the sorites, when in fact he doesn't need to solve it at all. I am not sure whether Horgan needs to include the section on transvaluationism. In its three-valued approach, it seems to my mind the weakest part of the discussion.

To "solve" the sorites, transvaluationism attempts to reject the inductive premise without becoming committed to holding that there is a sharp semantic cut-off point between statements in the sorites sequence. That is, transvaluationism must deny:

(IP) (n) (Bn > B(n + 1))

without being committed to:

(EP) (En) (Bn & ~B(n + 1))

In classical logic, to deny (IP) is, in effect, to hold that (EP) is true. Thus, transvaluationism must use rules other than those of classical logic to solve the sorites. On transvaluationist logic both (IP) and (EP) are not true. Horgan introduces two kinds of negation, a strong and a weak. Strong negation is the same as the negation of classical logic (~S). On this account, the strong negation of a statement S is true (correctly assertible) if and only if S is false (correctly deniable in the strong way). The weak negation of S (-S), on the other hand, is true if and only if S is not true (correctly assertible). Some statements on the transvaluationist account will be neither true nor false, that is, neither correctly assertible nor correctly

deniable. Both (IP) and (EP) are examples of such statements. The strong negations of these two statements are also neither true nor false. But, according to Horgan, "What *are* true, then, are the weak negations of these statements" (1994: 113). This would be:

$$\neg(\exists n)(Bn \ \& \ \sim B(n+1))$$

This means that for any number n, it is not the case that for any n, if an n-haired person is bald, then an $(n+1)$-haired person is not bald. The weak negation of the second statement,

$$\neg(n)(Bn > B\,(n+1))$$

means that it is not the case that for any number n, if an n-haired person is bald, then an $(n+1)$-haired person is bald. Additionally, the weak negations of the strong negations of the two statements are true:

$$\sim\neg(\exists n)(Bn \ \& \ \sim(B(n+1))$$

This means that it is not the case that there is not a number n, such that an n-haired person is bald but an $(n+1)$-haired person is not bald. And:

$$\sim\neg(n)\ (Bn > B(n+1))$$

means that it is not the case that not every n is such that if an n-haired person is bald, then an $(n+1)$-haired person is bald. The transvaluationist attempts to block the sorites by (weakly) denying both (IP) and (EP). This is done without commitment to the strong denials of (IP) and (EP), which on classical logic, would not be possible.

Transvaluationist logic is somewhat similar to the logic of supervaluations. Both accounts hold that certain statements will count a

neither true or false. On the supervaluationist account, these are the statements that are neither supertrue (true) nor superfalse (false), and on the transvaluationist account, these are the statements that are neither correctly assertible (true) nor correctly deniable (false).

One initial problem for Horgan's account is that it does not show that terms with inconsistent rules of application are themselves inconsistent. Perhaps vague terms are not in themselves inconsistent since, when applied, only one of the inconsistent rules are used. A term may have inconsistent rules for use, but as long as only one of those rule are used at a time, then no logical inconsistency exists. Consider the newly invented term "squircle." The rules for the terms' application are:

1) apply the term only to circular objects,

and:

2) apply the term only to square objects.

Although an inconsistency exists if both rules are in use when applied to the same object at the same time, there is no inconsistency if only one of the rules is used to apply to a particular object at the same time. The computer screen I am staring at is squircle and the letter "o" is squircle, too. If, however, both rules were attempted to be applied to the same object at the same time, an inconsistency would arise. Likewise, the rules for the use of a vague predicate, if not used at the same time, are not logically inconsistent. If, for example, an object that is very similar to a paradigm case of red is judged red, then the rule that is applied is the first, viz., the

collectivistic rule which dictates that objects that are not very dissimilar are to be placed in the same category. And if, for example, a blue object is judged as different from the paradigm case of red, then the rule employed is the second, viz., the individualistic rule which dictates that objects that are not similar are to be placed in different categories.

The problem of inconsistency only arises when both rules need to be used at the same time. In the paradoxical argument, Rule 1 (the collectivistic one) is stated in the inductive premise and Rule 2 (the individualistic one) needs to be used in order to avoid the false conclusion. But the sorites paradox shows only that these two rules cannot be used consistently *at the same time.* This may point to a third, higher-order rule for the use of vague expressions:

(Rule 3): Don't use Rule 1 and Rule 2 at the same time.

Or, perhaps, Rules 1 and 2 are to be construed as two disjuncts connected by an exclusive "OR". Or, maybe, the rules could be modified to specify when they are to be used and when not in a way that would require them to be used one at a time.

A Possible Unhappy-Face Solution to the Sorites Paradox

If the claim that once the senses of the rules for the use of vague expressions are made explicit -- where different contexts for the use of the rules are specified -- there is no logical inconsistency is true, then there is a very easy way to solve the sorites paradox. Once made explicit, the rules

for the use of vague terms that seem to conflict actually do not, since the rules are not applied in the same contexts. The sorites paradox asks us to use both rules in the same context. Hence, the paradox asks us to violate the rules for the use of vague expressions. What the paradox points to is not an inconsistency in the rules governing the use of vague expressions, but rather the need not to use the rules in the same context. If the two rules are treated as part of an exclusive disjunction, or made specific in a way that indicates separate contexts for the use to the two rules, or if a higher-order rule which dictates that they should not be used at the same time is added to the two rules, then there is no logical inconsistency. Horgan's distinction between logical discipline and logical consistency is thus unnecessary.

Conclusion

Thus Horgan's account, although perhaps better than Raffman's, has problems peculiar to it. While attempting to remove some of the troubling consequences of the incoherence theory, Horgan inadvertantly shows that vagueness need not be incoherent at all. Another option for an unhappy-faced solution claims that vagueness is the result, not of a set of incoherent rules for the use of vague expressions, but rather the indeterminacy of vague expressions' meanings.

Chapter Five

Schiffer on Vagueness and Indeterminacy

Introduction

In this last chapter of Part II, my main claims are that: (i) it is better to give an unhappy-face solution to the sorites paradox which appeals to the indeterminacy of vague expressions rather than to the incoherence of the rules for their application; and (ii) since Stephen Schiffer's unhappy-face solution is the only one discussed which does this, his is the best of the unhappy-face solutions discussed in this dissertation. After arguing for these two claims, I consider some *prima facie* problems for Schiffer's position, and some possible solutions to these problems. I also illustrate how it is possible that there are other unhappy-face solutions to the sorites which explain the sorites in terms of indeterminacy and are distinct from Schiffer's position.

Indeterminacy Versus Incoherence

Introduction. In the previous chapter, I claimed that Horgan's

contextualist treatment of vagueness inadvertently showed that, even granting Dummett's claim that there are inconsistent rules governing the application of vague predicates, vagueness need not be incoherent. In this section, I would like show that unhappy-face solutions to sorites paradox not only *can*, but *should* avoid claiming that vague predicates are incoherent. A much more plausible case can be made for a solution which points to the indeterminacy of vague expressions, since vagueness just *is* the admission of borderline cases, that is, cases that do not determinately fall into a vague term's positive or negative extension.

Why Indeterminacy and not Incoherence. Briefly, the incoherence thesis claims that the rules which govern the correct use of vague terms are incoherent in the sense that the competent speakers of a vague language such as English will be led, by rules that they would acknowledge as correct, to contradict themselves. And, because of this, there can be no coherent logic or semantics of vague expressions. The sorites is a genuine and unresolvable paradox which illustrates this incoherence (cf. chapter III, and Dummett (1975)). In chapter III, I claimed that three criticisms that Crispin Wright raises against the incoherence thesis fail to be decisive. Yet there are reasons, ones perhaps also not decisive, that do motivate giving an alternative type of unhappy-face solution. This alternative type of unhappy-face solution claims that the paradox arises due to some type of

indeterminacy[1].

An initial reason for preferring the alternative type of solution is that such a solution is more consistent with the central features of vagueness itself. One truism about vagueness is that it just is the admission of borderline cases, and another truism is that borderline cases are those where it is indeterminate whether a given predicate applies to the cases. As Smith and Keefe claim in the introduction to their book *Vagueness: A Reader*:

> Suppose Tek is a borderline case of tall. It seems that the unclarity about whether he is tall is not merely epistemic. For a start, no amount of further information about his exact height (and the height of others) could help us decide whether he *is* tall. Plausibly, there is no fact of the matter here about which are ignorant: rather, it is *indeterminate* whether Tek is tall (2, italics Keefe and Smith's).

Even in ideal epistemic circumstances there will be unclarity about whether or not Tek is tall. Thus it is natural to conclude that there is no fact of the matter about whether Tek is tall.

Even Timothy Williamson, who claims that there are determinate

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[1] Put roughly, to claim that a truth-value is indeterminate is to claim that there is no fact of the matter about what that truth-value is. To claim that a term indeterminately refers to an object is to claim that there is no fact of the matter about what unique object that term refers to. And to claim that a translation is indeterminate is to claim that there is no fact of the matter about which of multiple translations is the correct one.

cut-off's of which we are essentially ignorant, acknowledges this phenomenon. "If you bet someone that the next person to enter the room will be thin, and I [a borderline case of thinness] walk through the door, you will not know whether you are entitled to the winnings" and this is the case "however accurately my waist is measured and the result compared with vital statistics for the rest of the population" (1994, p. 185). Williamson uses claims regarding this phenomenon along with the assumption that "TW is thin or not thin" is either true or false to argue for our ignorance of whether TW is thin or not. If there is some determinate fact regarding TW's thinness, and no amount of empirical investigation will expose this fact, then we are necessarily ignorant of the fact.

However, if we do not accept the additional premise concerning bivalence, we need not draw Williamson's conclusion. Instead, it is indeterminate whether such utterances have truth-value. Incoherence, on the other hand, is not something that is central to the nature of vague predicates. If the principle of tolerance is correct, then there is an argument to this conclusion; but, at least initially, given the apparently successful ways in which we use vague terms, incoherence is not as centrally connected with vagueness as indeterminacy. In addition, avoiding the incoherence thesis is motivated by the drastic nature of the thesis. Given our communicative success, a response to the sorites which claims that vagueness is inherently incoherent is somewhat drastic. The indeterminacy thesis, although an unhapppy-face solution has the advantage of avoiding

such counterintuitive claims.

There is another reason for preferring an unhappy-face solution which explains the sorites paradox as the result of the indeterminacy of the meaning of vague expressions. Such a view is in accord with certain general and well-supported claims about meaning itself. Quine's famous argument for the indeterminacy of translation, for example, suggests that terms in general have indeterminate application to the world. And in "Some Thoughts on Radical Indeterminacy," Hartry Field claims that there is a "substantial level of indeterminacy in our concepts, though there is room for debate as to just how high that level is" (3). For example, consider the word "mass," a term that Field discusses in "Theory Change and the Indeterminacy of Reference," and "Quine and the Correspondence Theory". Newton's term "mass," according to the laws of special relativity, is capable of two separate interpretations, as rest mass and as relativistic mass. If we interpret "mass" as rest mass, then the sentence "Momentum is mass times velocity" comes out false, but true at low velocities; and if we interpret "mass" as relativised mass, then the sentence comes out strictly true. According to Field, there is no fact of the matter about which interpretation of "mass" is the correct one, and so there is no fact of the matter about whether "Momentum is mass times velocity" is strictly true. Newtonian "mass" partially denoted both rest mass and relativistic mass, and hence did not determinately denote either.

For another, less technical example consider the following situation.

My cat Sophia is practically indistinguishable from my next door neighbor's cat Scamp. The elderly man who lives down the hallway is not aware of there being two large black cats on the floor. Harold, my neighbor, instead thinks that both Sophia and Scamp are really just one cat, and refers to each as "Miss Kitty" when he sees one of them. In this situation, the term "Miss Kitty" partially denotes Sophia and partially denotes Scamp. So if he sees either Scamp or Sophia, he'll yell out "Miss Kitty's here!" If he sees Scamp, then the sentence "Miss Kitty's here!" will turn out true if we interpret "Miss Kitty" as denoting Scamp, and false if we interpret "Miss Kitty" as denoting Sophia.

Since good cases have been made for the indeterminacy of meaning in general, and since vague terms are plausibly thought to have "a special kind of indeterminacy," (Field, 1998, p. 2), it is natural to think that the successful solution to the sorites paradox will explain the kind of indeterminacy vagueness is, and how the sorites paradox follows from it. Since we are constrained to give an unhappy-face solution to the sorites paradox, a fruitful way to do so is in terms of this indeterminacy.

However, it is important to note that Field is not sympathetic to the project of giving an unhappy-face solution to the sorites paradox. Instead, he claims that vagueness is best understood in terms of a determinately operator which is similar to the definitely operator used by some supervaluationists. On Field's account, the inductive premise (IP) is determinately false, and its classical denial is determinately true. However,

there is no substitution instance on which (IP) is determinately false, and no substitution instance on which its classical denial is determinately true. I won't attempt to refute his position here, partly because I'm not sure I have a sufficient grasp of his view, but would like to point to a *prima facie* problem for his position. Although he may have a response to this worry, it seems to me that many of the same objections that apply to traditional supervaluationism apply to his position as well, including objections concerning higher-order vagueness, and the objection to supervaluationism concerning the existence of a witness.

Even though, unlike Field, we are looking for an unhappy-face solution to the sorites paradox, we can agree with his claims about the indeterminacy of meaning. Instead of trying to solve the sorites paradox using a determinately operator, an unhappy-face solution could use the indeterminacy of vague expressions as a way of explaining why the sorites paradox arises, and why it does not have a happy-face solution.

An Overview of Schiffer's Position

Stephen Schiffer gives an unhappy-face solution of the sort mentioned above. As mentioned earlier, in "Two Issues of Vagueness" Schiffer distinguishes between two kinds of partial beliefs: standard and vagueness-related. These two types of beliefs are defined stipulatively in terms of subjective probability. *Standard partial beliefs* (SPB's) are the

type of belief identified with subjective probability. For example, I have a partial partial about whether I have enough money in my checking account to cover a check I just wrote. Right now, I am willing to guess that I have enough money in my account to cover the check. I am, however, not completely certain. In the case of SPB's, a person who partially believes a proposition *p*, believes that *in principle* it is possible for her typically to get into a better epistemic position with regards to *p*, thus increasing (or decreasing) her degree of belief. In the present case, I partially believe the proposition that the amount of money in my checking account is equal or greater to the amount of money I wrote on the check. I believe that, *in principle*, it is possible for me typically to get into a better epistemic situation with regards to the proposition about the amount of money in my account. I could, for example, go to the bank and ask about my balance. And even if, for example, my bank was on the other side of the universe and totally incapable of being reached by me (sometimes it feels as though it is), I could *in principle*, typically get into a better epistemic position, thus increasing or decreasing my sp-belief.

Schiffer qualifies his definition of sp-belief with "typically" in order to avoid counterexamples like Goldbach's conjecture. Such a belief is one which I could not get into a better epistemic position about, yet it is a belief that is distinct from vagueness-related partial beliefs as well. Perhaps the best thing to say about such cases is that they constitute some third category of belief.

Standard partial beliefs are identified with subjective probability. If, for example, I believe to .7-degree that I have enough money in my account to cover the check, as well as believe to .5-degree that my modem's speed can run a communications program I need, then, since these two beliefs are independent of each other, I sp-believe to degree .35 that the check I wrote won't bounce *and* that I can run the program. And if I believe to .7-degree that my check won't bounce, and believe to .3-degree that the same check will bounce, then I believe to degree 1 that my check will or will not bounce.

Vagueness-related partial beliefs (VPB's), on the other hand, are those which cannot be identified with subjective probability. Consider, for example, a sorites series of dollars, starting with a billion dollars and ending with one dollar, where the numbers of dollars are subtracted one by one (i.e., $1,000,000,000, to $999,999,999, ..., to $1). When confronted with such a series of dollar amounts and repeatedly asked to think about whether a person who possessed that number of dollars is wealthy, a competent speaker of the language will progress from absolutely believing that a person with that dollar amount is wealthy, to absolutely disbelieving that this is so. Yet, in the cases which are not absolute belief or disbelief, it will not be be conceptually possible for that person to make a guess about the truth of her partial beliefs.

Such beliefs cannot be identified with subjective probability. If, for example, someone vp-believes to degree .6 that a person with $400,000 is

wealthy, and also vp-believes to degree .2 that a person with 5,000 hairs is bald, that person does not vp-believe to degree .12 that a person with $400,000 is wealthy *and* a person with 5,000 hairs is bald. Even in the cases where a competent speaker vp-believes to .6 degree that a person with $400,000 is wealthy and vp-believes to .4 degree that a person with $400,000 is not wealthy, the speaker will probably not vp-believe to degree one that a person with $400,000 dollars is wealthy or not wealthy. As Schiffer notes, "If [the speaker] is like most people, she'll have no idea what so make of that instance of excluded middle" (14).

To elaborate on what was said in chapter one, where VPB's that are held in ideal epistemic positions are *paradigm VPBs*, Schiffer gives the following as a definition of a borderline case:

> x is to some extent a borderline case of "F" just in case someone could have a paradigm VPB that x is F.

In order for the above condition to be necessary, every possible borderline case, x, of "F" must be one in which someone could have a paradigm VPB that x is F. And in order for the condition to be sufficient, meeting the condition alone must be enough to be a borderline case of F.

For the condition to be necessary, it need only be the case that, for each borderline case of a predicate, there is a possible world in which a person has a paradigm vagueness-related partial belief about whether the predicate applies to the case. For example, if Pat is borderline case of

baldness, then according to this condition, there is some possible world where a person has a paradigm vagueness-related partial belief about Pat's baldness. To show the above condition to be unnecessary, someone would have to show that, for some some borderline case, there is no possible world in which someone could have a paradigm vagueness-related partial belief that the vague predicate applies to the case. In other words, someone who wants to claim that the condition is not necessary must go through all the possible borderline cases of every vague predicate and find one case in which there is no possible world where a person could have a paradigm VPB that the predicate applies to the case. I can think of no such case, and am prepared to grant that the condition is necessary.

In order for Schiffer's condition to be sufficient, meeting it alone must be enough for something to be a borderline case. There must not, that is, be a case where the condition is met, and the case is not a borderline case. I think the requirement for sufficiency can be stated thus: there must be no possible world in which someone has a vagueness-related partial belief, and that belief is not about borderline cases of vague predicates.

Consider, again, one possibility discussed more briefly in Chapter One: Schiffer's own example of a precise but incompletely defined term "minor*" (p.8). A person is a minor*, if she has not reached her seventeenth birthday, and she is non-minor* if she has reached her twenty-first birthday. In the following scenario, a person who has reached her eighteenth birthday is, it seems, neither a minor* nor a non-minor*. A

belief about this person's minor*hood, though, cannot be converted into one about the likelihood of her being a minor* or a non-minor*. No hidden information about the person's age would indicate whether she is or is not a minor*. Yet, as Schiffer himself noted, nothing about 'minor*' "admits of borderline cases in the intended sense" (p. 8).

To this, Schiffer may respond that a belief about whether the eighteen year-old is a minor* is not a paradigm vagueness-related partial-belief. This is because someone who knows the meaning of the term "minor*" does not partially believe that an eighteen year-old is a minor*. Consider, for example, someone who knows the term's meaning who is confronted with a sorites series of ages, progressing by minutes, from ten to twenty-five years of age. If such a person were asked to think about whether a person with the various ages is a minor*, there would be a precise point at which she would say that the person turns from being a minor* into an undefined area, and there would be a precise point later where the person would turn into a non-minor*. In the undefined region, the person has no belief about the minor*hood of the eighteen year-old, or perhaps believes to degree 1 that the person is neither a non-minor* nor a minor*. Thus the above is not an adequate counterexample. And since I can think of no other possible counterexamples to the claim of sufficiency, I am also prepared to grant that Schiffer's condition is sufficient as well.

Vagueness-related partial belief, according to Schiffer, "dubiously coheres with the assumption that borderline propositions have truth-values

and with the assumption that they lack them" (21). VPB seems not to cohere with the assumption that borderline propositions lack truth-value, since VPB is a type of belief and hence concerned with truth. To partially believe some proposition is to believe to a particular degree of certainty that the proposition is true. A belief, it seems, is primarily concerned with truth. Consider, for example, how it inconsistent it seems to say "I believe it but it is not true." And if to believe a proposition *p* is to believe that the proposition that *p* is true, then to partially believe a proposition *p*, is to partially believe that *p* is true. Even if we explain vp-belief by claiming that we fully believe that a proposition is partially true, still the beliefs are about the truth-value of *p*.

On the other hand, VPB does not seem to cohere with the assumption that borderline propositions have truth-values either, since if there were some fact about the truth-value of such a proposition then it would seem that a VPB could then be converted into a belief about the likelihood of the borderline proposition being true. If someone has a paradigm vp-belief to degree .6 that a person with $400,000 is wealthy, then, assuming that borderline propositions have truth-values, it seems that such a belief would be able to be converted into an SPB about whether a person with that amount of money is wealthy. That is, if borderline propositions have truth-values, then its seems that VPBs could then be converted into SPBs. But it is part of the nature of vagueness that this could not be.

One way out of this puzzle is to claim that it is indeterminate whether borderline propositions have truth-values. According to Schiffer, the competent speakers of a language may themselves have vagueness-related partial beliefs about whether or not borderline cases have truth-values. If asked whether there is fact about whether Pat, a borderline case, is bald, competent speakers may have paradigm VPBs about whether this is so. That is, they may partially believe that this is so, without thinking that one would be able to bet on whether the proposition that-Pat-is-bald is true. According to Schiffer, "reflective participants in our conceptual and linguistic practices involving vague notions may themselves have paradigm VPBs toward the proposition that borderline propositions have truth-values (and even, alas -- for there is surely no commitment to excluded middle at the level of our commonsense logical concepts -- toward the proposition that they have them or lack them)" (18).

For Schiffer, we are rationally required to reject one part of the sorites paradox, the inductive premise; yet in doing this, it seems that we are then required to either accept the classical negation of the premise, or claim that its classical negation does not follow from the untruth of the inductive premise. And neither of these seems promising. A way out of this additional puzzle is to claim that although required to reject the inductive premise, it is indeterminate which of the entailments of its rejection is untrue, since it is indeterminate whether borderline cases have truth-values. We are rationally required to reject the inductive premise. But, just as it is

indeterminate whether borderline propositions have truth-values, it is indeterminate which of the the entailments of its rejection we are required to accept.

VPB, which is essential to vagueness, will generate the sorites paradox no matter whether or not a determinate notion of truth is adopted. This is because VPB dubiously coheres with borderline propositions having truth-values and with them not having truth-values. And since vagueness is ineliminable from the language, the paradox cannot be eliminated.

Criticisms of Schiffer's Position

There are certain questions that Schiffer's account invites. One concerns what Timothy Williamson calls the "subversive nature" (1997, p. 6) of Schiffer's position. Williamson's problem with the present account stems from the claims that: (i) it is indeterminate whether logical truths such as excluded middle hold, and (ii) "Our use of classical logic may be strained when we confront arguments, such as the sorites, which explicitly turn on the status of borderline propositions" (Schiffer, 1998, p. 21). Given Williamson's claim that the epistemic theory has made these initially troubling consequences avoidable, it is understandable why he thinks that Schiffer's view is implausible.

However, two points should be made concerning Williamson's criticism. First, as argued in chapter two, it is not clear that epistemic

position, or any view that gives a happy-face solution, is a plausible position on vagueness and the sorites paradox. And second, the apparently troubling consequences of Schiffer's position need not be as devastating as they appear. As Schiffer notes, "Classical logic will continue to serve us as well as it now serves us" (1998, p. 21). And with regards to theories of truth and meaning for natural languages, not only is it not "clear what sort of theories of truth and meaning we need, and therefore not clear that vagueness isn't already well enough accommodated in the ones we do need," (1998, 21), but "we may actually need very little in the way of 'theories' of meaning and truth for natural languages" (ibid., 22).

Williamson (1997) has raised what I take to be a distinct objection to Schiffer's position. He claims that:

> For Schiffer, logic is an intrinsically unreliable instrument, at least when we are reasoning with vague concepts, which is virtually always. Every now and again it will lead us from true premises to false conclusions. If we try to work out which arguments a logic misevaluates, we must use a metalogic to do so. To consider whether a vague argument is truth-preserving, we must apply the metalogic to attributions of truth to vague propositions; for Schiffer those attributions are equivalent to the vague propositions themselves, and therefore equally vague: thus our

> metalogical reasoning will be equally unreliable. We cannot reliably work out which arguments our logic misevaluates (6-7).

Williamson's objection is a misreading of Schiffer's position, because Schiffer does not claim that the rules of logic break down. He instead appeals to the indeterminacy of the truth of these principles. Perhaps, though, there is a way to strengthen Williamson's objection. Although Williamson's comments misread Schiffer's accounts as claiming that the rules for the application of vague predicates are inconsistent, a more accurate objection along these lines would point to our inability to determinately describe how it is that vague expressions are indeterminate. Perhaps a kind of higher-order indeterminacy objection can be raised to Schiffer's position. However, a higher-order indeterminacy objection is not forceful, since the indeterminacy theorist would grant that her claims about indeterminacy are themselves indeterminate, and hence not capable of being said in a determinate way.

Finally, a criticism can be raised concerning the metaphysical status of baldness. Why, it may be questioned, does Schiffer assume that there is not some kind of belief-independent nature to the property baldness, and instead give an account of baldness that takes our beliefs about baldness as essential to the nature of baldness itself? Isn't baldness a mind and language independent property, and our beliefs about baldness secondary to

this? To this type of criticism, Schiffer has responded that given that propositions and properties are language-created, the direction of the inference from facts about the cognitive and linguistic practices of competent speakers of a language to the nature of properties is a good one. If properties and propositions are a kind of "gift" of our linguistic and cognitive practices, then it is natural to look to these practices for explanations of the nature of these properties.

At any rate, it is important to note that not all unhappy-face solutions which use indeterminacy to explain the sorites paradox need take the form that Schiffer's solution takes. Even if there is a successful objection to his position, there are other positions in logical space which give unhappy-face solutions to the paradox and do so in a way that explains the kind of indeterminacy involved in generating the paradox. It is possible, for example, to drop Schiffer's claims about vagueness-related partial belief, and his claims about the inductive premise being untrue *faute de mieux*, and still give an unhappy-face solution which appeals to the indeterminacy of the meaning of vague terms. To illustrate this, consider the following stark and perhaps trivial position: there is no fact of the matter about the truth-value of borderline propositions; and since the parts of the sorites paradox express borderline propositions, there is no fact of the matter about their truth-value. No one part of the sorites is the "odd-guy-out," so no happy-face solution can be given to it. What the paradox illustrates is the indeterminacy of vague terms. Although perhaps a hard view to maintain,

such a position is at least intelligible, and hopefully shows that Schiffer's solution is not the only unhappy-face solution in logical space which appeals to the indeterminacy of vague terms.

Conclusion

In sum, unhappy-face solutions to the sorites paradox should claim that vagueness is a type of indeterminacy rather than a type of incoherence. Schiffer's solution, which is the only unhappy-face solution which does this, is therefore the most plausible of the positions discussed in this dissertation. Although certain objections to Schiffer's position can and have been raised, I have argued that these criticisms either misread his position, or else can otherwise be put aside. In the following chapter, I show how this type of unhappy-face solution can be applied to other philosophical paradoxes.

Part III:

Chapter Six:
Applications
to Other Philosophical Paradoxes

Introduction

In previous chapters, I claimed that the only adequate solution to the sorites paradox is an unhappy-faced one. My main reasons concern the central features of vagueness, the implausibility of prospective happy-face solutions, and the sheer stubbornness of the paradox. I claimed that these features all required that an unhappy-face solution be given to the paradox. In the present chapter, I am going to outline a similar treatment of other philosophical paradoxes, and consider whether unhappy-face solutions should be given for every genuine philosophical paradox. I will focus on the skeptical paradox and the liar and try to extrapolate from these and the sorites, to an account of paradoxes in general.

The two main questions that I'll try to answer in this concluding

chapter are: (i) is the successful solution to each genuine philosophical paradox an unhappy-faced one?; and (ii) if so, does this unhappy-face solution take the form of the kind that I argued was the successful solution to the sorites paradox? Put another way, (i) do all genuine paradoxes have an unhappy-face solution?; and, (ii) if so, does this solution involve an indeterminacy in meaning? Although my conclusions in this final chapter are somewhat tentative, I'll suggest affirmative answers to both questions.

By way of review, a *paradox* is an argument with apparently true premises, using apparently correct reasoning, with an obviously false conclusion. The following two paradoxes were chosen because of the their philosophical importance, and because certain unhappy-face solutions have been proposed to them already.

The Liar

Briefly, the liar paradox has both a weak and a strong version. The weaker version of the paradox can be most quickly derived from the following sentence:

L1) This sentence is false.

L1, taken with the further claims about what follows from the truth and falsity of L1 gives us a paradox. The further claims are:

2) If L1 is true, then L1 must be false.

3) If L1 is false, then L1 must be true.

4) L1 is either true or false.

L1, taken with, (2), (3), and (4) lead to:

5) L1 is both true and false.

A simple solution to the paradox as stated above is to claim that L1 is neither true nor false, that is, to say that (4) is false. If this is so, then both (2) and (3) are trivially true, and (L1) is neither true nor false.

A strengthened form of the liar paradox drops (4) and replaces it with a claim that does not assume bivalence, but law of excluded middle.

L2: This sentence is not true.

2a) If L2 is true, then it is not true.

3a) If L2 is not true, then it is true.

4a) Either L2 is true, or else L2 is not true.

5a) L2 is true and L2 is not true.

Whereas the former version of the liar paradox (using L1) called into question bivalence and admitted the response that the sentence was neither true nor false, the latter version (using L2) does not invite such a response, since it assumes the law of excluded middle only. Denying premise (4a) in the second version of the liar (using L2) is less plausible than denying premise (4) in the first version (using L1), since it is harder to claim that a logical rule does not hold than a metalogical rule. It is possible to introduce three truth-values: Truth, Falsity, and Neither, and still keep law of excluded middle. But those who deny excluded middle must give some account of the following argument:

1) Not (P OR Not P)

2) Not P and Not Not P [from 1]

3) Not P [from 2]

4) Not Not P [from 2]

5) P [from 4]

6) P OR R [from 5]

7) R [from 6 and 3]

On classical logic, if we deny excluded middle we can derive every statement of the language. To deny excluded middle is not to claim, as was claimed earlier, that it is indeterminate whether the law holds. If it were the same, then the above argument would need to be explained by unhappy-face indeterminacy theorists as well. However, the indeterminacy theorist need not claim this. Those who out-and-out deny that the principle holds in certain instances, however, need to explain how it is that in these instances, everything does not follow. For example, one way to do this would be to claim that the inference from (6) to (7), using disjunctive syllogism, is not valid in this case.

Tarski's Unhappy-Face Solution to the Liar

Tarski gave an unhappy-face solution to the liar paradox, claiming that the paradox shows that our natural language conception of truth is

incoherent. His "solution" does not point to any flaw in the liar, and hence did not explain why the flaw looked so plausible. Instead, he claimed there is no solution to the paradox in this sense.

However, Tarski does explain why there can be no happy-face solution to the liar paradox. In "The Semantic Conception of Truth," (1944), Tarski makes a distinction between two types of languages: semantically closed and semantically open. A *semantically closed* language contains predicates like "true," "false," and "satisfies." These semantic predicates can be applied to the language's own sentences. Natural languages, such as English, are semantically closed languages. *Semantically open* languages, in contrast, are ones in which no sentence of the language can predicate a semantic property to any other sentence in the language. In semantically open languages, no sentence can predicate a semantic property of itself. (L1) and (L2) are well-formed sentences of only semantically closed languages. In semantically open languages, which are the only types of languages we need for mathematical and scientific purposes, the paradox does not arise.

Tarski's explanation is that, due to the semantically closed nature of natural languages, such languages are inconsistent, and hence lead to paradox. To avoid paradox, we can give a semantics with an object-language/metalanguage distinction. Tarski explains:

> Since we have agreed not to employ semantically closed languages, we have to use two different languages for

> discussing the problem of truth....The first is the language which is "talked about"....The definition of truth which we are seeking applies to the sentences of this language. The second is the language in which we "talk about" the first language, and in terms of which we wish...to construct the definition of truth for the first language. We shall refer to the first language as "*object-language*" and to the second ast the "*meta-language*" (Tarski, 1944, 21-22, quoted in Kirkham (1992)).

Although semantically closed languages are incoherent, languages with object/metalanguage distinctions are coherent, and do not admit of the Liar sentence. Tarski's T-sentences, such as:

> "Snow is white" is true iff snow is white.

are sentences of the metalanguage and are about sentences in the object-language. In the above case, the T-sentence is about the object-language sentence "Snow is white." In a T-sentence with the strengthened liar sentence, though,

> "This sentence is not true" is true iff this sentence is not true.

the sentence in the quotations marks is not a sentence of the object language. If it were, then the object-language would not be an open language, since it refers to another sentence in the object language, namely, the sentence "This sentence is not true" itself. If the distinction between object and metalanguage is preserved, then the liar, it seems, cannot arise.

It is important to note, though, that this solution is not one that is meant to be a solution to the paradox as it appears in natural languages.

Although Tarski gives an unhappy-face solution which claims that our natural language conception of truth is incoherent, an alternative to this view would claim that our natural language notion of truth is instead indeterminate, and attempt to explain the type of indeterminacy involved. It seems that Tarski's only reason for thinking that our ordinary notion is incoherent is that the liar paradox arises in it, and not in a language with a separate metalanguage, or so he thinks (cf. Kripke (1975)). Two of the three reasons given as to why it is best to avoid claiming that the sorites arises due to the incoherence of vague predicates apply equally well to the liar paradox. The first reason is that this type of unhappy-face solution is less drastic than one which cites the incoherence of the notion of truth. Given the intuitiveness of the claim that our everyday notion of truth serves us quite well in most cases, appealing to the incoherence of the everyday notion seems too drastic. And the second reason is that such a solution is in accord with with more general and well-supported claims about meaning itself. If philosophers like Quine and Field are correct, and there is a substantial degree of indeterminacy in our language, then a natural way to treat the liar paradox appeals to some feature of the indeterminacy of the notion of truth that causes the paradox to arise. Moreover, since truth itself is vague, a similar treatment to the liar might be given as was given to the sorites paradox, namely, by giving an unhappy-face solution in terms of

indeterminacy in the notion of truth.

The Skeptical Paradox

As noted in chapter four, a version of the skeptical paradox is the following (Schiffer (1990), DeRose):

1) I know I have hands, only if I know that I'm not a brain in a vat.

2) I don't know that I'm not a brain in a vat.

---

3) I don't know that I have hands.

The above argument is paradoxical, since its first and second premises seem true, it employs apparently correct reasoning, and its conclusion seems obviously false. The first premise is very plausible; it merely claims that it is a precondition for knowing an intuitively true fact (like the fact that I have hands) that I also know that I cannot be radically wrong in my judgments, as I would be if I were a brain in a vat. I can only know that statements as simple as "I have hands" are true, if I also know that I am not almost entirely wrong in my judgments. The second premise claims that I can be radically wrong in my judgments. Given that we are fallible creatures, premise two is intuitively plausible. The reasoning involved in the skeptical argument is also hard to question, since the conclusion is

drawn using *modus tollens*, which is not too controversial a rule of inference. However, the conclusion, that I cannot know that I have hands is unwelcome, especially since the same type of argument can churn out conclusions that deny that I can know many intuitively obvious facts.

An unhappy-face solution to the skeptical paradox would explain what it is about knowledge that causes the paradox to arise. One way to do give such a solution is point to some kind of incoherence in our conception of knowledge. Consider, for example, the following unhappy-face solution: It is part of the concept of knowledge that certain facts are capable of being known to us. That is, we use the concept to apply to some cases. For example, it is not stretching the concept of knowledge to say that I know that my dissertation is about the sorites paradox. Yet it is also part of the concept that we are fallible, given that we are finite creatures with limited mental capacities. An unhappy-face solution to the skeptical paradox, could claim that the paradoxes exposes an inconsistency in these two purported features. On the one hand we admit that we are fallible, and in fact, capable of being wrong in a radical way. And yet it is also part of use of "knows" that there are obvious truths about which we are not mistaken. On the one hand, we admit that we can be radically wrong in our judgments, and on the other we say that we can't be radically wrong in our judgments. Hence, there is something inconsistent about the concept of knowledge. The paradox exposes this inconsistency which cannot be eliminated from our everyday concept of knowledge. Hence, the paradox cannot be eliminated.

Another type of unhappy-face solution would try to explain why no happy-face solution can be given by explaining some kind of indeterminacy involved that leads to the skeptical paradox. For example, such a solution could point to how vague knowledge involves believing, justifiably, that a proposition *p* is true. Because the truth is worked into the concept of knowledge, a similar treatment of the sorites and liar could be given for our concept of knowledge. Or, perhaps, such a solution could explain how our use of the concept knowledge makes it indeterminate which of two standards for knowing are employed. In chapter IV, a comparison was made between two standards for knowing, one strict and one less strict. Acccording to the strict standard, we know a proposition *p*, if and only if, every possible alternative to *p*, is examined and shown not to be true. On the less strict standard, we know a proposition *p*, if and only if, the most plausible alternatives to *p* are examined and shown not to be true. An unhappy-face solution could point to some feature about our cognitive or linguistic practices that make it indeterminate which of these two standards are used. (Such as...)

Two of the same motivations for unhappy-face solutions to the sorites and liar paradox apply here as well. A solution which appeals to the indeterminacy rather than incoherence is less drastic and in accord with plausible claims about the indeterminacy of meaning. So it may very well be that such a solution is best given to the skeptical paradox as well.

Motivations for Giving Unhappy-Face Solutions to Most (or All) Genuine Philosophical Paradoxes

The two minor motivations that I gave for giving unhappy-face solutions to the sorites paradox in chapter one apply equally well in the cases of the liar and the skeptical paradox. I claimed in chapter one that although they do not necessarily show that the sorites is unresolvable, two reasons for thinking this is so comes from the sheer length of time that paradox has gone without a definitive solution and the number of accounts that have attempted and failed to provide an adequate solution. Although it is possible there is a happy-face solution to these paradoxes which has eluded philosophers since the time of the ancient Greeks, the sheer stubbornness of the paradoxes suggests that such a solution is not likely. As Schiffer has noted, most genuine philosophical paradoxes such as the Liar and the skeptical paradox have, like the sorites, remain without an adequate happy-face solution.

Another partial motivation comes from a generalization from the sorites, liar and skeptical paradoxes. If, as I claim, the sorites enjoys an unhappy-face solution, and the liar and skeptical paradox probably do as well, then *perhaps* most (or all) philosophical paradoxes enjoy the same kind of solution. Admittedly, a generalization from one, or possibly three, paradoxes to all is a bit hasty. If this were the only motivation, then I too

would not be persuaded. Yet when combined with other motivations, and future similar analyses of several such paradoxes, a generalization is more plausible.

Some Concluding Suggestions

If my claims in this dissertation are correct, the sorites paradox will have an unhappy-face solution which explains, in terms of indeterminacy, how the paradox arises. And if my tentative claims in this chapter are correct, then most, if not all, genuine philosophical paradoxes will have an unhappy-face solution of a similar type. A worthwhile philosophical project would then be to explain the type of indeterminacy involved in the various philosophical paradoxes. In this final chapter, I have tried to outline how such a project might be carried out, but limits of scope and time prevent me from elaborating any further.

At any rate, to sum up: the sorites has unhappy-face solution which explains the kind of indeterminacy involved in the paradox. And, perhaps, most (or all) philosophical paradoxes will have similar solutions.

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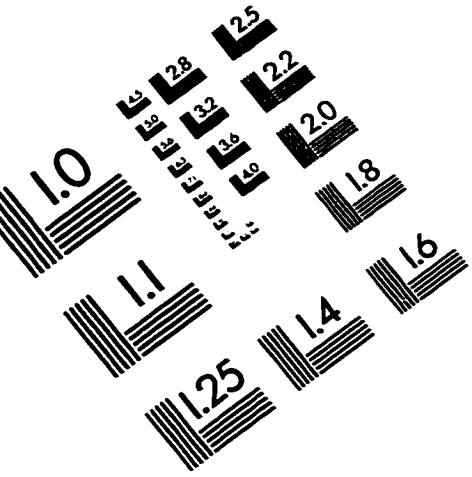
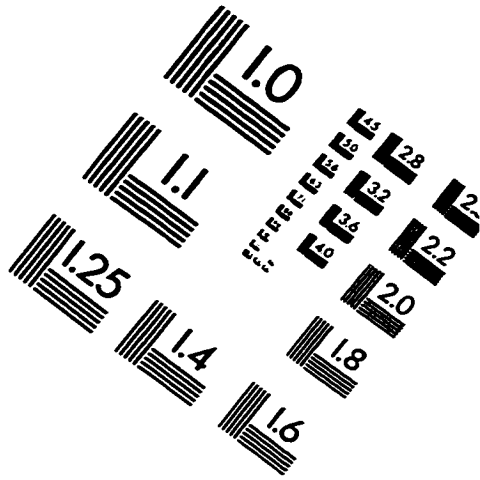
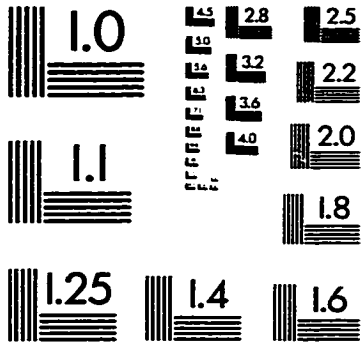
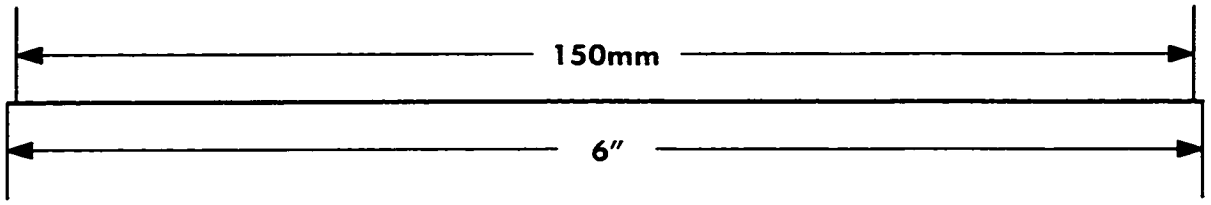
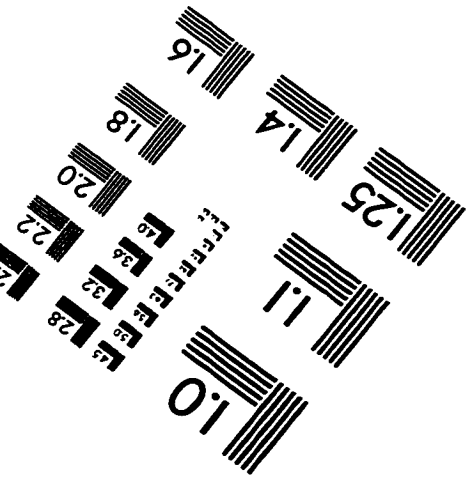
IMAGE EVALUATION TEST TARGET (QA-3)

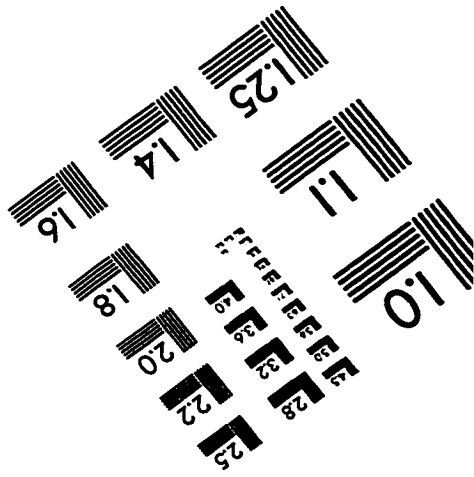












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