among rational numbers in one model octave, $\frac{1}{2}$, I hope his algebra can be simplified. The question is how best to secure an orderly *limitation*. It is the scale, not the algebra, which organizes and gives meaning to tone numbers. I am not trying to appear mathematically wise. 'Inner computer and music' happens to lie in a topological terrain with which Plato —assisted by several of the best minds in my university—had previously made me familiar. Lefebvre operates algebraically beyond my depth. Do his methods have some musical advantage I have overlooked?

(13) Lefebvre began with the assertion that, 'apparently we do not know what music is, in the sense that we do not have a model of it'. Tenny agrees with him.

A new kind of music theory is needed which deals with the question of *what* we actually hear when we listen to a piece of music, as well as *how* or *why* we hear as we do (Tenny, 1985).

These questions haunt all of us who think about music.

But Lefebvre is thinking far beyond music. He is wondering how minds work, and working under the pressure to discover it in time. The point is not whether he is right or wrong about anything, but whether his efforts are useful in advancing theory. I hope so.

Acknowledgements

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Comment on interpersonal affiliation and the golden section by R. B. Zajonc

Constants in science are invaluable because they play the role of known factors that can be entered into equations and enable us to find solutions where we previously could not because there were more unknowns than equations. Constants replace these unknowns with fixed values. Whenever a science discovers a constant, its development gains momentum and research surges forward with an unprecedented speed.

But the social sciences have few constants. Except for a few constants that apply locally to restricted theories, there are no constants that can be applied to fundamental

processes—constants such as Planck's constant or the speed or light. It is, therefore, with a great deal of excitement that one welcomes Lefebvre's theory of reflection which has generated a constant.

The excitement is doubled by the fact that the constant is related to Φ, the golden section, for the golden section is itself a beautiful mathematical relation which enters into hundreds of mathematical processes, from the Fibonacci series to phyllotaxis. The very fact that $\Phi = \Phi^{-1} + 1$ has fascinated artists and mathematicians alike.

But no one among social psychologists, to my knowledge, suspected that the golden section would enter into interpersonal relationships. Lefebvre (1987) should be congratulated on his insight. For there is a harmony between the form of the theory and the subject he treats—as in art. His model concerns the feelings 'good' and 'bad', or perhaps one would say 'good' and 'other than good', because 'good' is set equal to 1 and it is otherwise 0. It is thus fascinating that the interpersonal feelings that take on the values 'good' and 'otherwise' should be so intimately related to the golden section, and that the 'good' would prevail by 0.118. . . .

Besides those that Lefebvre examined, there are several other instances in the socio-psychological literature where interpersonal relations approximate the constant 0.618. . . For example, DeSoto & Kuethe (1959) asked subjects to assign probabilities to various forms of interpersonal relationships. Subjects were told to imagine some people, such as an hypothetical Jim and an hypothetical Ken, who were acquainted with each other. The subjects were asked to make a best guess that Jim liked Ken. They chose from a set of seven alternatives: definitely no, very probably no, probably no, chances about even, probably yes, very probably yes, and definitely yes. When these responses are converted into numerical values of 0, $\frac{1}{6}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{5}{6}$, and 1, the average of 100 subjects' responses is 0.59 which is only a small fraction away from 0.618. . .

If the hypothetical situation is changed to some extent such that another hypothetical person, Ron, is introduced, there is little change in the estimates provided that the relation presented to the subject is $P(aRb|cRb)$, where a is Jim, b is Ken, and c is Ron. Thus, if we know that Ron likes Ken, our subjective likelihood that Jim likes Ron too does not rise.

However, reciprocation does have powerful effects. If Jim knows that Ken likes him, the likelihood that he likes Ken in turn, that is, the relation $P(aRb|bRa)$, is estimated to be 0.74, which exceeds Lefebvre's limit of 0.666. . . by a substantial amount. It must be noted, however, that in the table of results which DeSoto & Kuethe present and which includes a variety of other relations and configurations (e.g., trusts, is afraid of, feels superior to, etc.), the value 0.74 is the highest.

Subjective feelings associated with inner states do not always tend toward positivity, however. Thus, for example, Kanouse & Hanson (1971) found what they called a negativity bias in evaluations. The negativity bias consists of assigning a greater weight to negative judgments than to positive ones. Thus, a subject is more likely to trust the statement 'Joe is bad' than 'Joe is good'. Why is that? The premise underlying the explanation of the negativity bias is that a positive feeling or judgment represents a default value. If we know nothing else, we tend to make a positive judgment. Hence, the judgment may not be veridical because it includes not only all the cases that are substantiated but also all those about which we know nothing at all. But a negative judgment is never given in default—it always requires some grounds.

Another circumstance where negativity predominates is in self-disclosure. A recent survey of emotions carried out in California asked respondents to recall their most recent feelings. Negative feelings, such as sadness, anger, and disappointment dominated

happiness, joy, and positive surprise. And it is also the case that in a typical prisoner-dilemma game, competitive ('bad') choices dominate co-operative ('good') choices.

How should these diverse data be interpreted in the light of Lefebvre's constant? Note that the situations which I cited are not always those where we deal with bipolar constructs. In order for Lefebvre's theory to apply, the judgments must not only be bipolar but they must be made on a single dimension. If the subject may consider more than one dimension, then greater complexity arises. Given a single dimension and bipolarity, the judgment 'likes' should represent the complement of 'dislikes'. This is indeed so in the DeSoto–Kuethe data. P(aRb) was 0.59 for 'likes' and 0.42 for 'dislikes'. However, these need not be so if we allow the subject to think in more complex terms, for example 'likes for a friend', 'likes for a bridge partner', 'likes as a co-worker', 'likes as a leader', etc. Here the weights associated with the various dimensions may not be distributed equally over the positive and negative poles and the judgments 'likes' and 'dislikes' might not be the complements of each other. These considerations do not damage the integrity of Lefebvre's constant, because like all constants, it too applies only under specified conditions.

It is clear that the interpretation of interpersonal relationships in terms of the golden section has considerable promise, and the applications which Lefebvre mentions in his paper should be further explored at the empirical level. Above all, future research should attempt to specify the conditions where the constant applies and distinguish them from those that cause systematic departures.

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Comment on some critical issues in Lefebvre's framework for ethical cognition and reflexion by William H. Batchelder

Lefebvre's (1982) book is the most comprehensive discussion of his basic theoretical framework called an 'algebra of conscience'. The framework permits him to construct a variety of model 'individuals' with differing structural interpretations. Each individual can be characterized as having multiple levels of reflexion, and each level may (or may not) include images of the individual, a partner, and the nature of the interaction between the two. All these images are thought to be possessed by an 'individual' (real or imagined) at a lower level of reflexion.