

The “genetic code” of melody:
Cognitive structures
generated by the implication-
realization model

Process

Figure 3 is a musical notation example illustrating a process. It consists of a single staff with a treble clef, showing a sequence of notes. Above the staff, there are seven bracketed intervals, each labeled with a direction: (d), (d), (d), (d), (d), (d), and (d). The first six intervals are labeled 'P' (Process), and the seventh is labeled 'D' (Descent). Below the staff, there are two rows of labels: 'Interval:' and 'Register:'. Each row contains seven pairs of 'A A' labels, corresponding to the seven intervals above. The 'Interval:' row shows 'A A' for all seven intervals. The 'Register:' row shows 'A A' for all seven intervals.

Interval:	Register:
A A	A A
A A	A A
A A	A A
A A	A A
A A	A A
A A	A A
A A	A A

Figure 3

I call such patterns where both intervallic similarity and registral continuation of ascent or descent are realized **registral-intervallic processes (or simply *processes*)**

P:方向相同 (上升或下降)

Process

Figure 3 displays a musical staff with a treble clef, showing a sequence of notes and rests. Above the staff, seven brackets labeled (d) indicate intervals. The first six brackets are labeled 'P' (Perfect), and the seventh is labeled 'D' (Duplication). Below the staff, the intervals and registers are specified for each pair of notes:

Interval:	Register:
A A	A A
A A	A A
A A	A A
A A	A A
A A	A A
A A	A A
A A	A A

Figure 3

A corollary to process is iteration or **duplication**, symbolized by the letter D within the bracket; unlike all other patterns, duplication always implies interval (a unison), registral direction (lateral), and specific pitch (e.g., C-C-C).

D:三个音都相同

Process

Partial Denial

Pitch: a b a' a b a' a b a' a b a' a b a a b a

Interval: AA AA AA AA AA AA AB AB

Register: A B AB AB AB AB AA AA

Figure 4

I call such patterns I call such partially realized patterns of similar intervals **intervallic processes** and symbolize them with the letters IP (note how the unison figures into this in the third example). IP:音程几乎不变 语域方向变化

Similarly, I call partially realized patterns where registrally zigzagging intervals are exactly the same **intervallic duplications** (ID). ID:第一个音与第三相同 与二不同

Process

Partial Denial

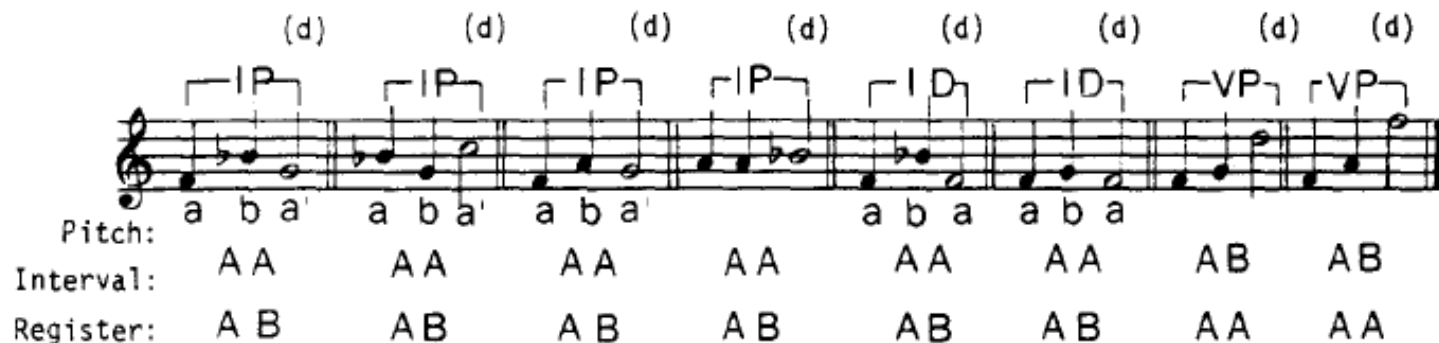


Figure 4

Partial realizations of this type- where initially implied registral direction is continued but intervallic differentiation(A+B) occurs instead of intervallic similarity (A+A) - I call **registral processes** (mnemonic: V=vector=registral direction).

VP : 语域方向不变 第二音程相比较第一音程更大
(大于人们心理预期范围)

Implication of reversal



Figure 5

Some patterns within the parameter of melody are capable of creating closure in and of themselves (though usually assisted by (d), (h), and (b)). One such type is intervallic-registral reversal or simply **reversal**, when a listener hears a large interval (P5 or greater), he expects, all other things being equal, a change in registral direction (A+B) and a differentiation of interval

R : 人们假设听到了一个大的音程之后 在语域和音程都发生变化

Implication of reversal

Partial Denial of reversal (IR,VR)

(d) (d) (d) (d)

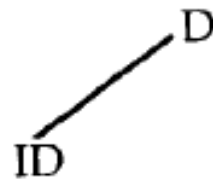
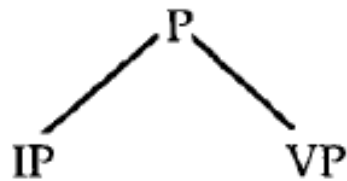
Interval: A B	A B	A B	A B
Register: A B	A B	A A	A B

Figure 5

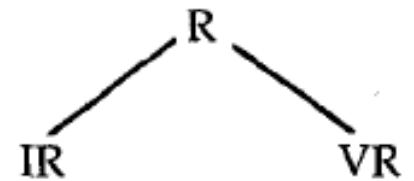
The intervallic implication of reversal (that a small interval is to follow a large leap) can be realized, while registral implication (that direction is to reverse) can be denied. I call such partially realized patterns ***intervallic reversal***. IR : 相比R 只是方向发生了变化即同向

Conversely, given a large initial leap, registral implication can be realized while intervallic implication is denied. This pattern I call ***registral reversal***. VR: 由一个较大的音程到一个更大的音程

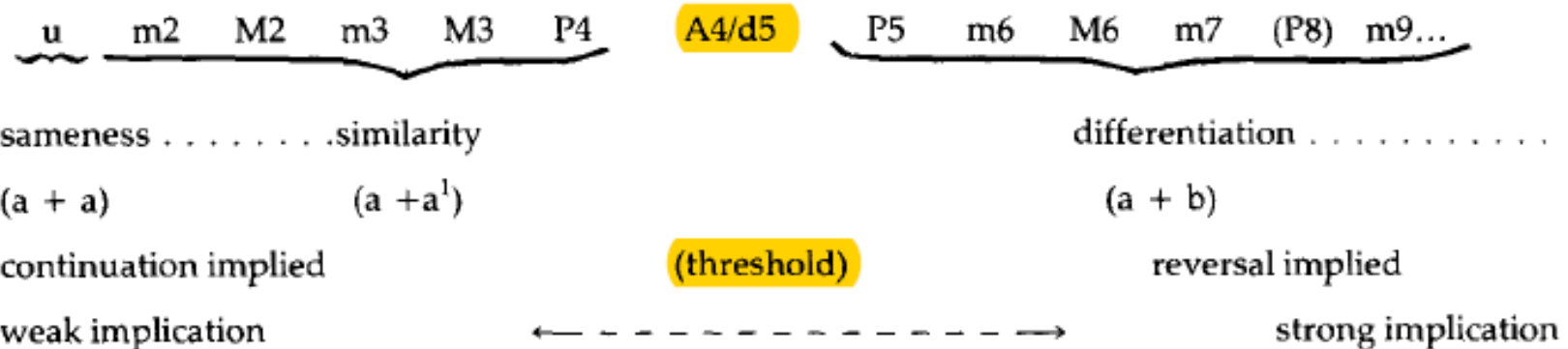
The hypothesized parametric scale



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(P=process; IP=intervallic process; VP=registral process; D=duplication [iteration]; ID=intervallic duplication [intervallic iteration]; R=reversal; IR=intervallic reversal; VR=registral reversal)



Retrospective realizations (complete denials)

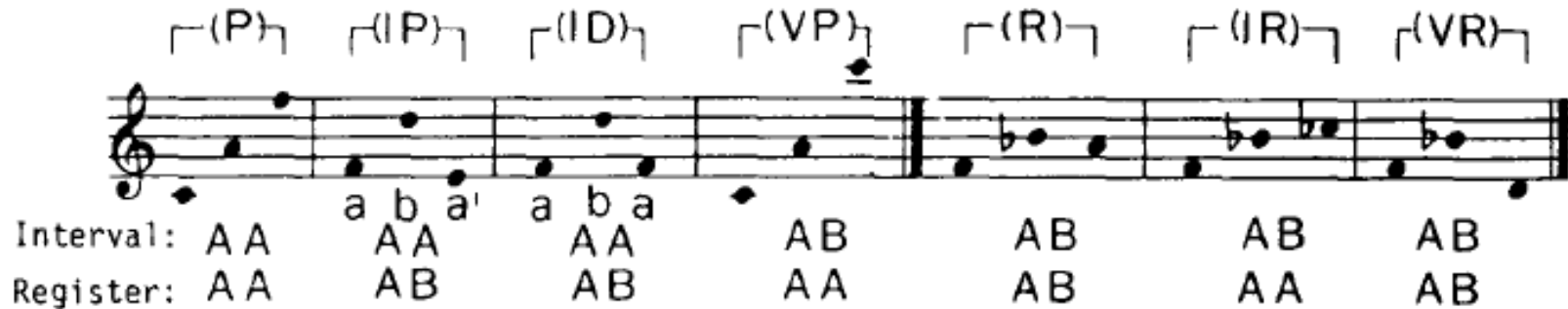


Figure 6

It so happens that even if the pitch, interval, and registral direction implied by large intervals is denied, **large intervals nevertheless can retrospectively come to be heard either as processes (P), intervallic processes (IP), or registral processes (VP).** And it so happens that even if the aspects of pitch, interval, and registral direction implied by small intervals are denied, **small intervals may still retrospectively come to be heard either as reversals (R), intervallic reversals (IR), or registral reversals (VR) even though none of these realizations was originally implied.**

The 'genetic code'

a.

Ma dall'a-ri-do stelo di-vul - sa

b.

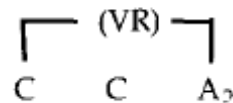
O guerrie - ri del - la Cro - ce;

Figure 10 Verdi, *Un Ballo in Maschera*, Act II, sc. 1; *I Lombardi*, Act IV, sc. 2.

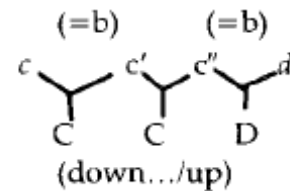
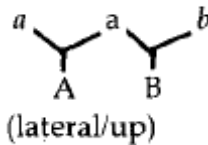
Encoding

LEVEL 1

structures:

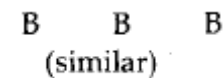
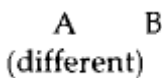


itches:



reg. items:

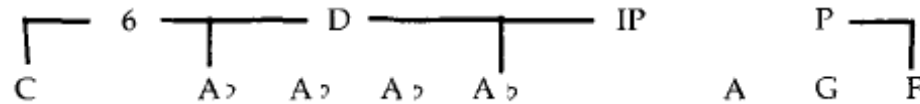
reg. patterns:



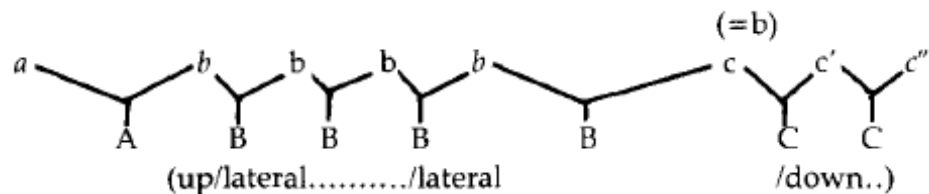
int. patterns:

LEVEL 2

structures:

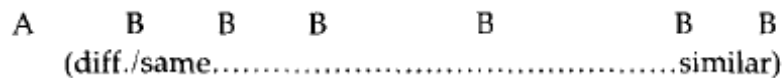


itches:



reg. items:

reg. patterns:



intervals: