

[On fugues and functionalism]

Eamonn Bell
Research Fellow
Department of Music
Trinity College Dublin
<belle2@tcd.ie>

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Rough Draft

The Composition of a Fugue:
Protocol and Comments*

M. Sanchez and W. R. Reitman

The Composition of a Fugue:
Protocol and Comments

M. Sanchez and W. R. Reitman

This paper contains the data underlying an investigation of the processes of music composition. The goal of the project is a set of heuristic computer programs which will incorporate many of the information processing techniques used by a human composer.

Brief descriptions of the basic research orientation, and an informal report on progress to date are available elsewhere.^{1/2/} A more comprehensive report describing the analysis of these data will be forthcoming shortly.

The research described in these reports is being supported by a Faculty Research Fellowship to the second author from the Social Science Research Council, and by funds from the Graduate School of Industrial Administration and the Carnegie Corporation.

1/ Reitman, W. R. Heuristic programs, computer simulation, and higher mental processes. *Behavioral Sciences*, Oct., 1959.

2/ _____ Programming intelligent problem solvers. *IRE Transactions of the FGSE*, Mar., 1961.

Sanchez, M., and W. R. Reitman. "The Composition of a Fugue: Protocol and Comments." CIP Working Paper No. 37 (Rough Draft), November 1960. 157pp. Herbert A. Simon Collection, Carnegie Mellon University Library. Box 8. Folder 446.

1 Carrying out the idea of enlarged syncopation

2

3

4



5 That won't work, because it's repetitive of the theme itself. This is where

6 it becomes hard to work with someone around, or without being able to think

7 freely, having to speak.. And now I begin thinking pianistically, too, what

8 is going to...I can't write single notes too long.

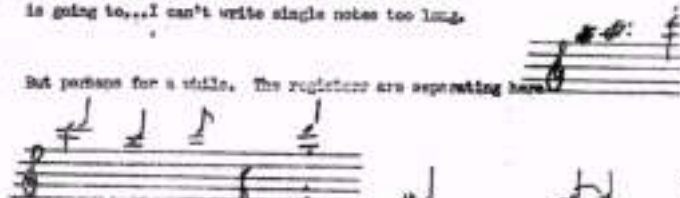
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10 But perhaps for a while. The registers are separating here

11

12

13



14 And that's unfortunate.

15

16

(erasing) I think we'll abandon the idea of the enlarged syncopation to get

17 away from repetition of theme... and try to do something more pianistic... the

18 idea comes of getting a more complex rhythmic situation against the theme, which

19 is rather rigid...a very definite duplo feeling (counting)

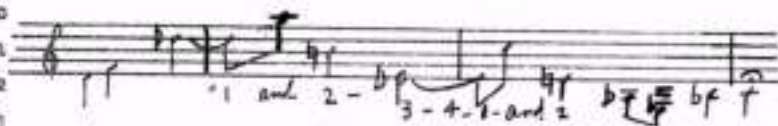
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25 Possibility of something in the counter melody in triplets, but it may become too

26 complicated to work with soon in the piece. (erasing) we can try a quicker syncopation,

27 with pianistic effect...and we get into the stylistic process of large

28 intervals, larger and larger intervals in the counter melody...

Wassily Kandinsky. *Fugue*. 1914.
Moscow. Oil on canvas. 129.5 x 129.5
cm.



- Walter Reitman
- b. 1932
- Michigan (PhD)
- **Asst. Prof.** Carnegie Tech (1957–1964?)
- Michigan MHRI
→ RPI afterward

Credit: IRE Human
Factors (1961)



- Marta Sánchez
- b. 1923
- d. 2006
- **Dalcroze
instructor**
(later Prof.)
Carnegie Tech
(1957–1997)



Credit: CMU

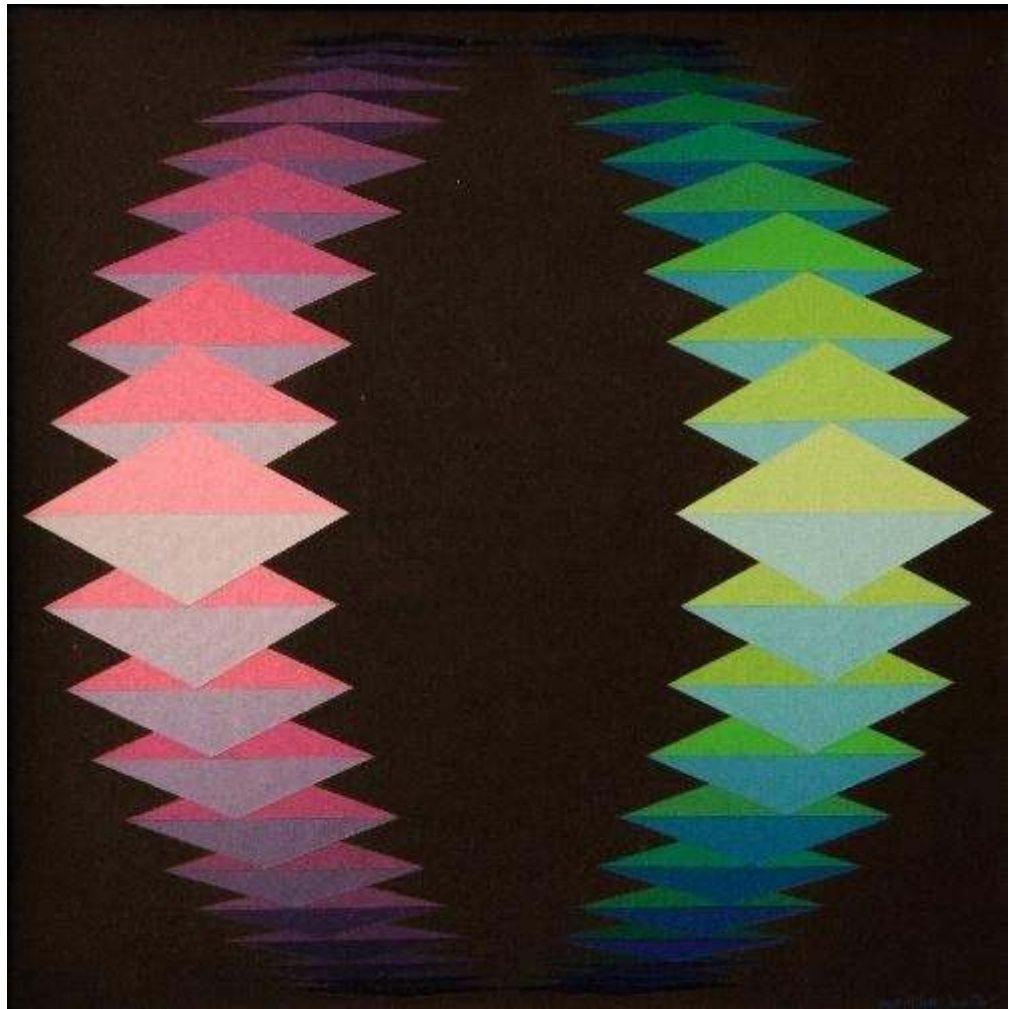


František Kupka, *Amorpha, fugue en deux couleurs* (Fugue in Two Colors). 1912. Paris, France. Oil on canvas. 220 x 221 cm.

Reitman, Walter R. *Cognition and Thought: An Information-Processing Approach*. New York: Wiley, 1965.

“Creative Problem Solving:
Notes from an Autobiography
of a Fugue”

Martha Boto. *Double Fugue*. 1975.
Paris. Acrylic on canvas. 50 x 50 cm.



Our original aim was to see whether and how [fugue composition] might be brought within the framework of the General Problem Solver. **Our surrogate question was: How might we reproduce and account for the composer's behavior using GPS as a model of the thinking processes involved?** In other words, we used GPS as a tool for studying the behavior we observed in the protocol. **We found that there appeared to be important aspects of the behavior we could not encompass within the framework of the early GPS versions with which we worked.** The result was the evolution of our own framework [(Argus)], in many ways derived from the GPS model, but differing from it in some respects. In particular, the effort gave rise to the problem framework presented in Chapter 5 ["Problems"] and the active memory model of problem solving to be presented in Chapter 8 ["Argus: An Information-Processing Model of Thought"].

(Reitman 1965, 180)



MUSIC

Music is pattern--temporal pattern, too.
Expectation, recognition, tension, release

What are the ingredients of musical pattern?

Outrageous hypothesis: they are the same as
the elements in letter series patterns and
the supposed pattern of the stock market--

SAME and NEXT on familiar alphabets

The alphabets--or scales: diatonic, chromatic,
triads, rhythmic (1, 2, 3) 'u, etc.

How test the hypothesis?

Can we describe pieces of music so formally
and accurately that we can automatically
produce the sheet music from them?

Can we induct the pattern description from
the music?

Can we automate the composing of music--for
this is a form of problem solving.

Now we have closed the cycle--we are back to
problems solving and choice--central activities
of management. What we learn about them in
music will be a basis for new insight into
business.

MUSIC AND THE STOCK MARKET

Jan. 18, 1967

GSIA winds

INTRODUCTION

Music of the spheres--Kepler
Cycles and bells--business cycles

But I'm going to talk about GSIA--
why so much we do in teaching and

(0)

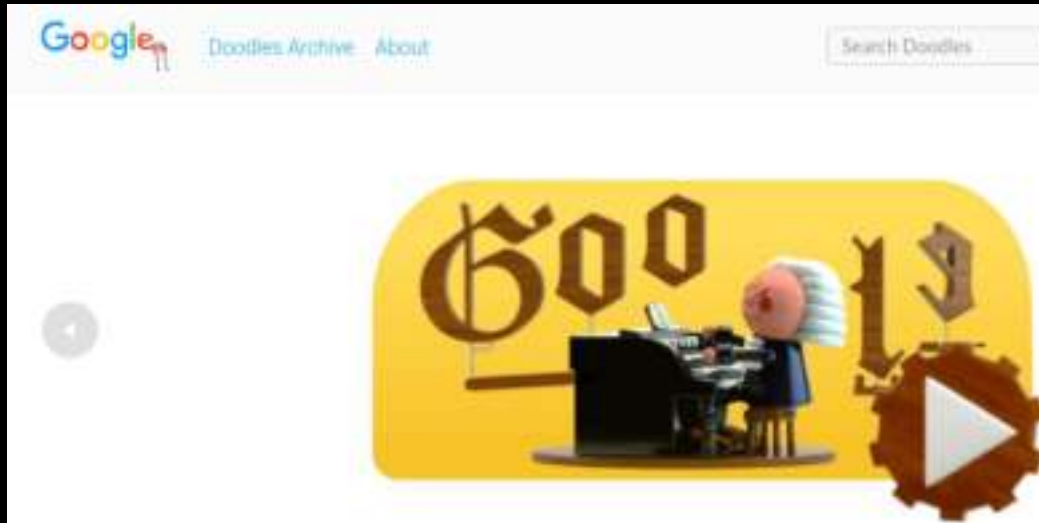
II

Northwestern U.
April 11, 1967

Music and the Stock Market

Introduction

Herbert A. Simon (1916–2001)
**economist, cognitive
psychologist**



“Celebrating Johann Sebastian Bach.” Accessed November 19, 2020.
<https://www.google.com/doodles/celebrating-johann-sebastian-bach>.