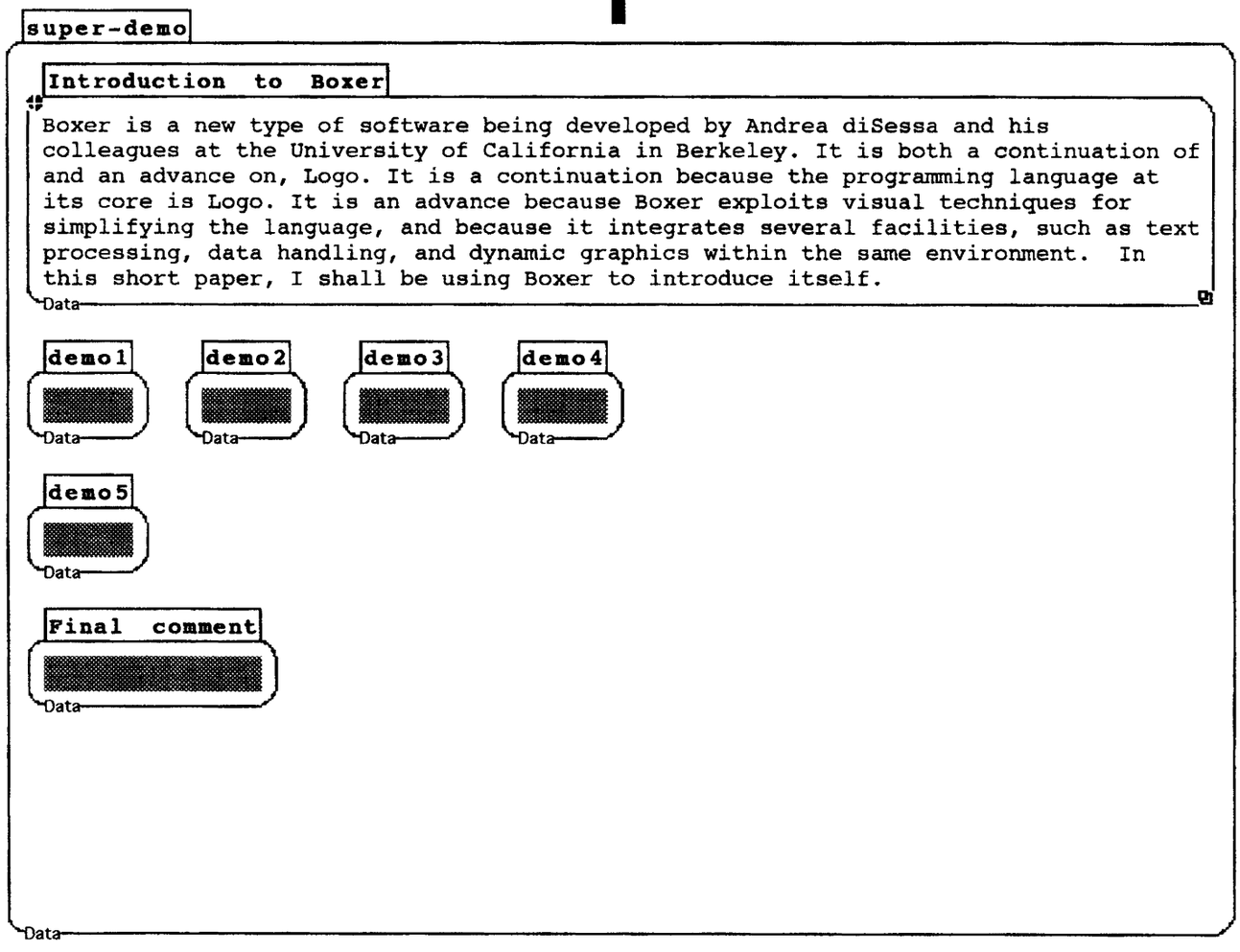
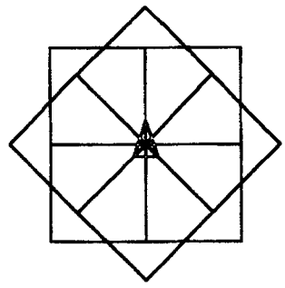
BOXER introduces itself

by Declan O'Reilly, University of Sheffield



demo1



Data

menu

```
fd 30
cs
square 10
cs rotate-square 40
```

Data

square

```
input side
repeat 4
```

fd side rt 90 (Doit)

Doit

rotate-square

```
input x
repeat 8
```

square x
rt 45 (Doit)

Doit

Some more details

It is called Boxer because everything is organised around the metaphor of a box. Programs are simply rectangular boxes, while data appears in boxes with rounded corners. These can be seen above along with a graphics box and name-tag boxes. Boxes can be open or closed and their sizes varied. There is no distinction between editor and workplace as in most versions of Logo: you can edit what you see on the screen.

Data

Data

demo2

Data

menu

```
fd 30
cs
square 10
```

Error: Can't find a box named SQUARE

Data

```
cs rotate-square 40
```

Data

rotate-square

```
input x
repeat 8
```

square x
rt 45 (Doit)

square

Doit

Doit

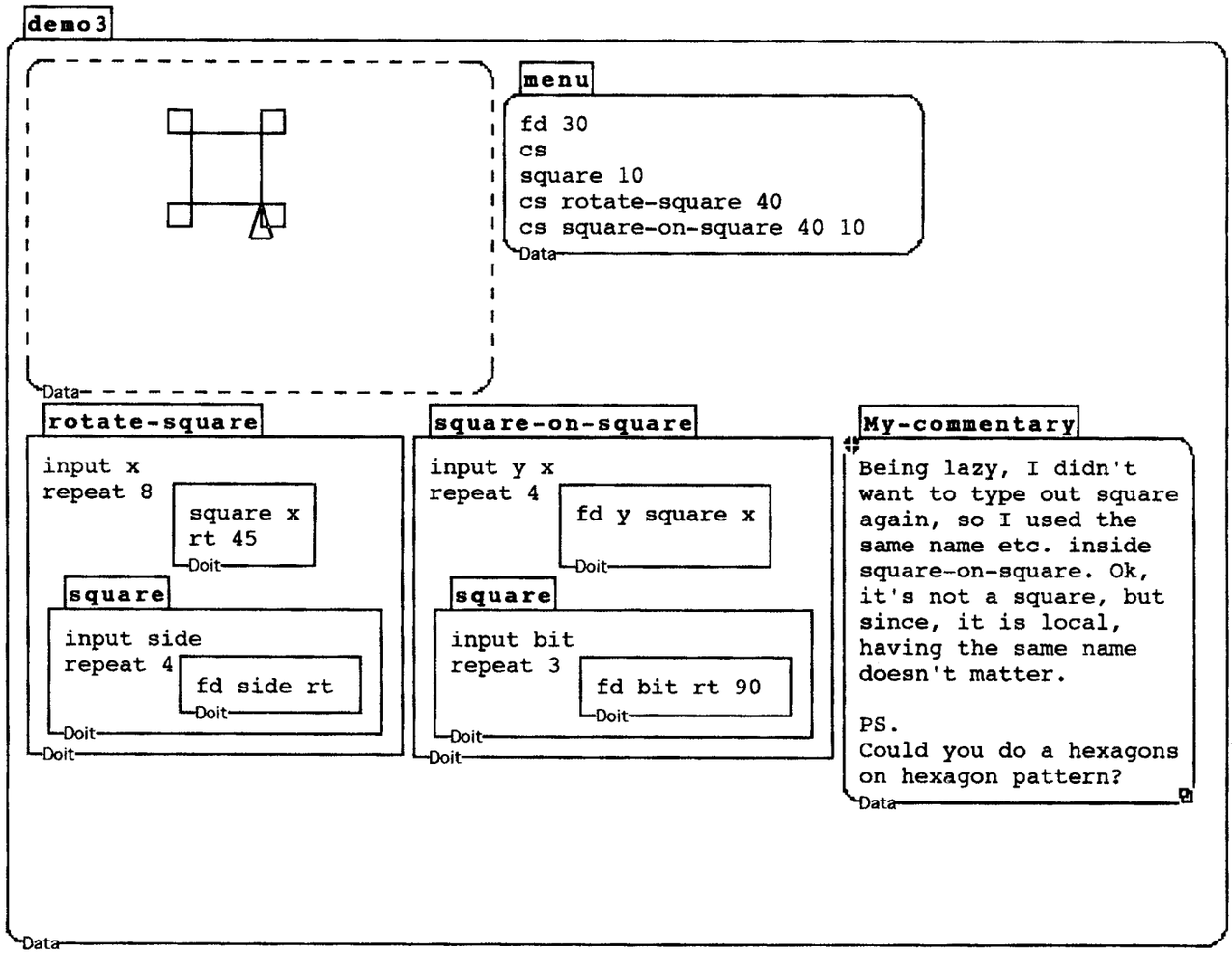
My-commentary

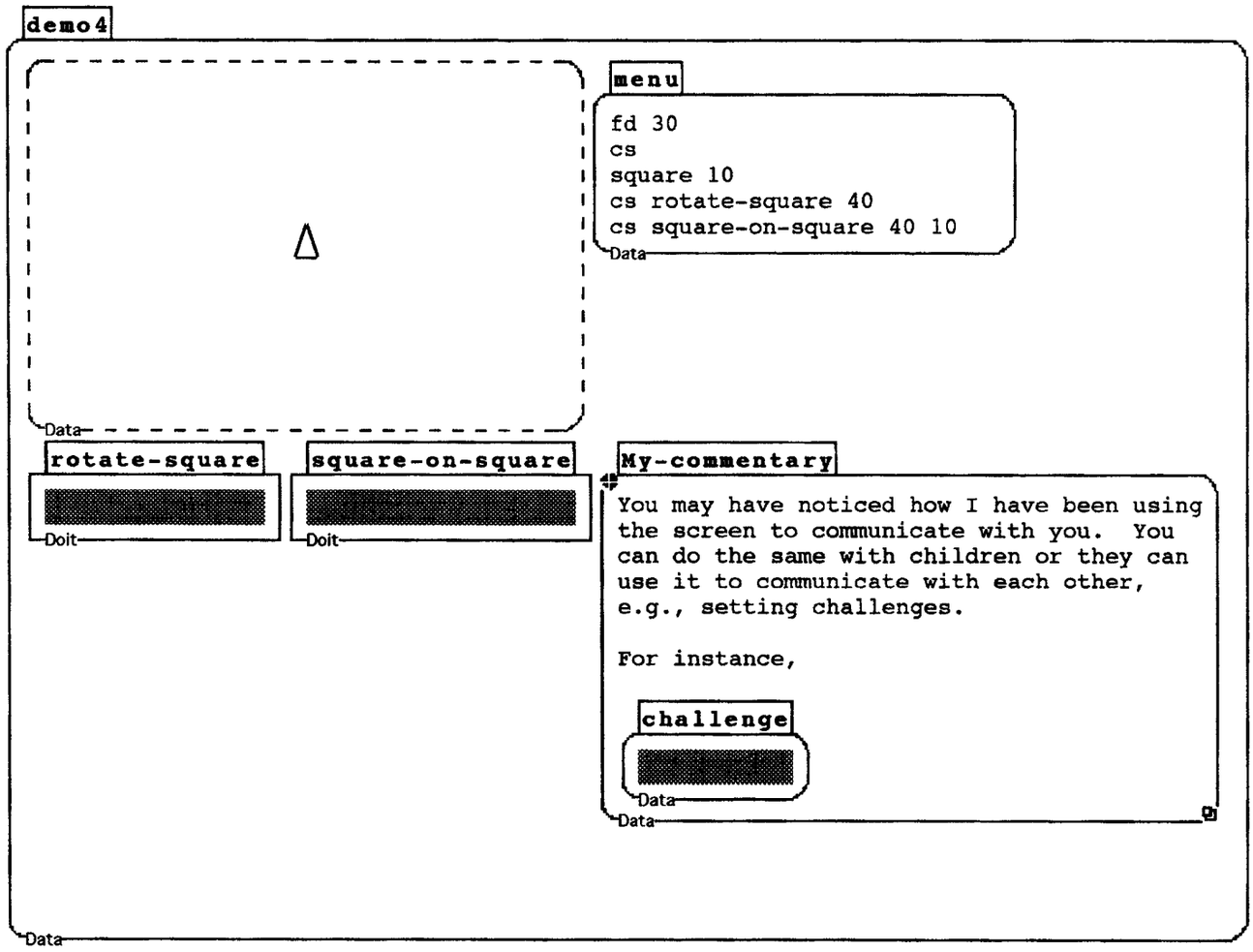
This time, I have placed the doit box 'square inside the 'rotate-square' box. 'rotate-square' can be run from the menu as before, but look what happens when I try to run 'square'. I get an error message because 'square' is local to 'rotate-square'.

Note also that I've closed the 'square' box getting rid of unnecessary details.

Data

Data



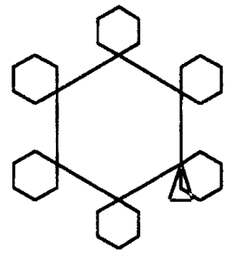


My-commentary

You may have noticed how I have been using the screen to communicate with you. You can do the same with children or they can use it to communicate with each other, e.g., setting challenges.

For instance,

challenge



Data

message for elaine

Hi Elaine,

I've learnt how to do the hex-on-hex challenge. I bet you can't do an oct-on-oct?

Julia

Data

hex-on-hex

Doit

menu

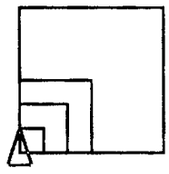
cs hex-on-hex 40 10

Data

Data

Data

demo5



Data

menu

fd 30
cs
square 60

Data

square

input mutt
repeat 4

fd mutt
rt 90

Doit

mutt

30

Data

Doit

My-commentary

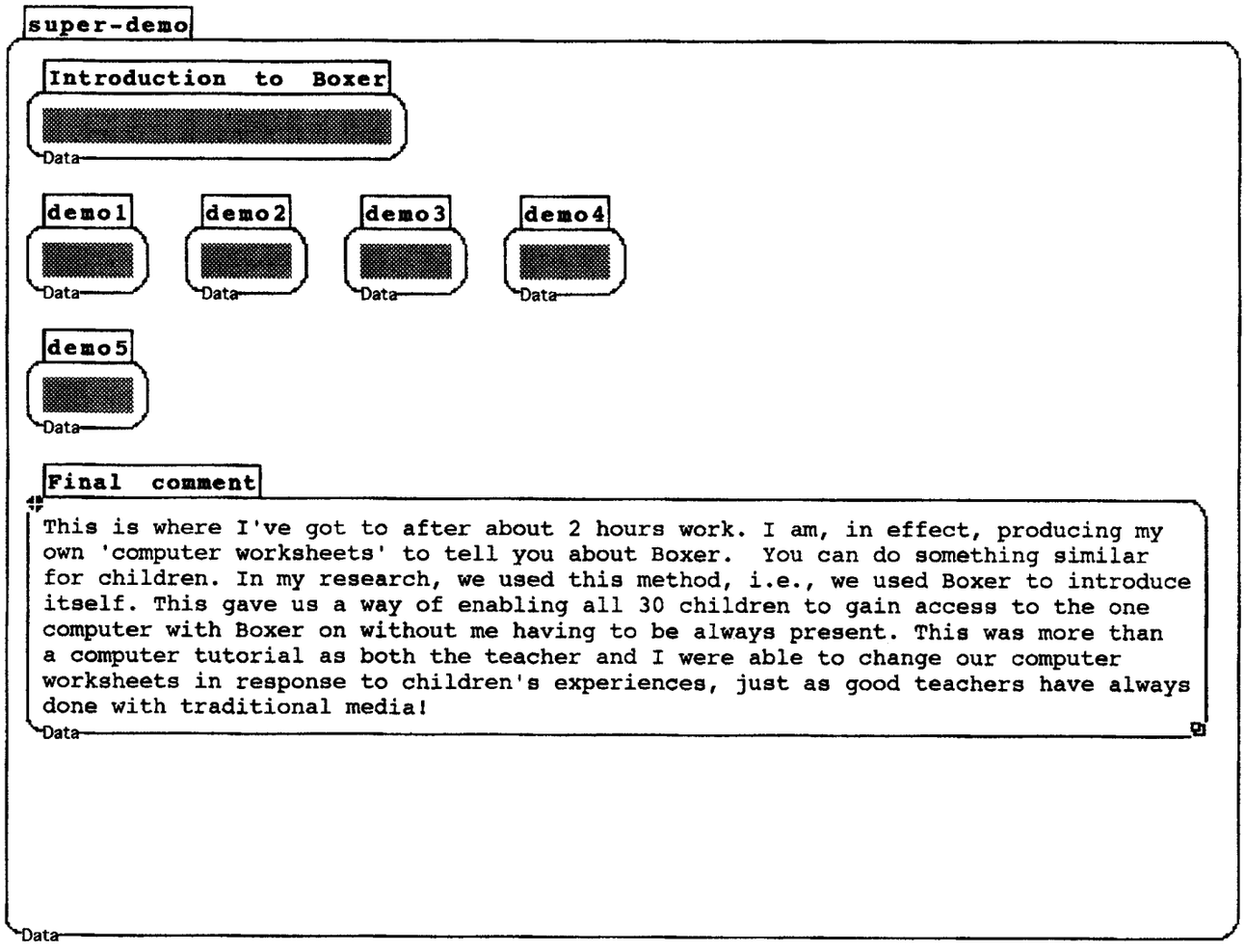
You may also have noticed how I have been using variables right from the start.

In Boxer, a variable is simply a named data box. I introduced variables to year 5 children by using internal data boxes like 'mutt'. To change the value of the variable, they had to go inside the box to change the numbers. There was little difficulty with this idea. One child said: "They're called variables 'cause you vary them."

In the above diagram, the small squares have been obtained by running the line 'repeat 4 ...' with the values 10, 20 and 30 in 'mutt' respectively from inside 'square'. The big square was obtained by running 'square 60' from the menu.

Data

Data



I have deliberately chosen to end this article by coming out of Boxer and using a conventional word-processing package. I have done this by way of warning. Boxer is not commercially marketed yet. The version that I have running on my Mac, for example, is entitled 'Experiment Mac Boxer', and its word-processing is not on a par with commercial products. It requires a lot of memory: (preferable 12 megs or more) and it costs $200 for a school license.

I am ending on this sober note because I believe that the lessons of Logo suggest that exaggerated claims, in the long run, can do more harm than good. I personally believe that there is a place in school for programming—and not just in mathematics—and Boxer looks like the kind of language to fill that place.

References

diSessa, A. A. (1986d). From Logo to Boxer, A New Computational Environment. *Australian Educational Computing*, July, 8–15.

diSessa, A. A., Abelson, H. and Ploger, D. (1991). An overview of Boxer. *Journal of Mathematical Behaviour*, **10**, 2.

Hoyles, C. and Noss, R. (1992). Introducing Boxer. *Micromath*, **8**, 3.

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