An elephant – or what use can be made of metonymy?
Celina Kadej, Matematyka #2, 1999

Linear equations with one unknown can be solved already by students in the elementary school. Those are simple equations and students often formulate them by themselves while solving word problems. Sometimes the problems lead to equations a bit more complex than the elementary additive equations of the type x + a = b.

I have had an opportunity to listen to the discussion of two enthusiastic students solving a standard word problem: *The sum of two numbers is 76. One of the numbers is 12 more than the other. Find both numbers.* It was a problem from Semadeni's set of problems for the 3rd grade and one had to solve it using equations and that's where the difficulty appeared:

Przemek (read Pshemik) wrote the equation: x + (x+12) = 76. To solve it was a bit of a problem for him, but still he dealt with it. He drew an interval and then a following dialog had taken place [between him and his friend Bart]:

P: *That is that number*: he extended this interval by almost the same length, and the another one like that.

And this is that number plus 12

B*: and this all together is equal to 76…*

P*: No, this is an equation, d'you understand…*

B could not accept it…

B: *Why did you draw this interval? You don't know yet what it's supposed to be?*

P: *That's not important.*

B: *Why 76?*

P: '*cause that's what is in the problem*

B*: that iks, that iks add 12 and that's supposed to be 76..?*

P: *Look instead of iks there is a little square in the book* – P showed the little square in the book.

B: *Aha, but here, here is written something else*

P: *But it could be as here. And now I am inputting a number into this square*.

B: *A number?! Why into the square?*

P: *No, it's into the window. Into this window I input the number which comes out here.*

B: *But here is a square* – B insisted.

P: *It's not a square but a window, and one inputs the numbers into that window*.

B: *How so*?:

P: *Two windows are equal 64, one window is equal 32. Well, now, you subtract 12 from both sides*, and *you see that the two windows are equal to 64*.

B: *But are there numbers in the windows*?

P: *Two windows are 64, so one window is 32*

B: *Window!?*

P: *That's right, a window. Look here:* ***an elephant*** *and* ***an elephant*** *is equal* ***64****. Therefore what is* ***one elephant*** *equal to?* ***Two elephants*** *are equal* ***64****. So,* ***one elephant*** *is* ***equal*** *to what*?

B: ***An elephant****? Hmm, I see.* ***One elephant equals 32****. I understand now… so now the equation…*

P: *If* ***two elephants*** *are equal* ***60****, then* ***one elephant*** *is* ***equal*** *what?*

B: An elephant?, ok, one elephant equals 30. I see it now…..Now equation……..**aaaaaaa**

Thinking about that dialog one can have several questions: Why an elephant in Przemek's thinking? Why window didn't work for Bartek neither did line interval but an elephant worked? Where did the elephant come from?

There were two statutes on the bookshelf, a piggy and an elephant. Piggy doesn't work of course because of associations it brings (in Polish, at least) but the elephant was neutral, ready to be taken as a symbol of some mental object. An elephant was used as an adequate symbol of a mental object, which often is called an iks, but it doesn't have to. His action was not accidental. He used here what's called a metonymy. When we solve mathematical problems, especially algebraic problems, we often use metonymy.

Comment of the editor: A different, equally speculative reason, suggests itself from the point of view of searching for a hidden analogy underlying this Aha!Moment Whereas "a piggy" or a pig is well known animal in Poland, the elephant is not, apart from pictures and movies, and therefore it fits much better as a hidden meaning of "unknown" than a quite well known "piggy" within the perceptual/logical bisociative framework present in this Aha!Moment.