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About the Meaning of Personal Pronouns

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N a   p r a w a c h   r ę k o p i s u

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Streszczenie

W pracy podano formalną definicję znaczenia zaimków osobowych. Znaczeniem zaimka jest pewien podzbiór obiektów z ustalonego zbioru X. Pozwala to wprowadzić działania teoriomnogościowe na zaimkach oraz określić równoważność zaimków. Podano przykłady takich równoważności.

Summary

This note contains formal definition of the meaning of personal pronouns. The meaning is identified with certain subset of a fixed set X. Thus we are able to define set-theoretic operations on pronouns and define the equivalence relations on pronouns. Some examples of equivalent pronouns are given at the end of this note.

This is a modified version of the lecture delivered by the author at Paris University during International Seminar on Formal Linguistics held in September 1968.

1. Let X be some fixed set of speaking individuals. C(x, y) will stand for "x speaks to y" and S(x,y) is the abbreviation of "x speaks about y", where $x,y \in X$. C_x will denote the set of all $y \in X$ such that C(x,y), i,e. C_x is the set of all listeners to x. We assume that for all $x \in X$, $x \in C_x$. S_x is to mean the set of all $y \in X$ such that S(x,y), i,e. S_x is the set of all individuals from X, x is speaking about. If A is a set then $|A|$ denotes the number of elements of X. $\cup$, $\cap$ are the symbols for sum and union of sets respectively, ϕ denotes the empty set and if $A \subset X$ then - A denotes X-A.

Let $\Sigma = \{\sigma_1, \ldots, \sigma_k\}$ be some finite set called the vocabulary. Elements of Σ are called words. Let γ be a function which associates to each element of X word form Σ. The expression $\gamma(x) = \sigma$ is to read as: x said the word σ. To each word σ from Σ spoken by $x \in X$ we shall associate meaning defined by the function

$$v : X \times Z \to 2^X$$

such that

$$v(x,\sigma) = \begin{cases} S_x, & \text{if } \sigma = \gamma(x) \\ \text{undefined}, & \text{if } \sigma \neq \gamma(x) \end{cases}$$

Instead ot v (x,σ) we shall write $v_x(\sigma)$. In the case when confusion will not arise, we shall identify words with their meanings writing σ instead $v_x(\sigma)$.

2. Let $\Sigma = \{$ I, you.s, he, we, you.p, they $\}$. Elements of Σ are called personal pronouns or, in short, pronouns.

We define the meaning for this vocabulary as follows:

$v_x(I) = x,$

$v_x(\text{you.s}) = C_x - x$ and $|v_x(\text{you.s})| = 1,$

$v_x(\text{he}) = z,$ where $z \in -C_x$

$v_x(\text{we}) = C_x$

$v_x(\text{you.p}) = C_x - x$ and $|v_x(\text{you.p})| > 1,$

$v_x(\text{they}) = -C_x$ and $|v_x(\text{they})| > 1$

You without the letter p or s means you.s (singular) or you.p (plural).

If α, α' are pronouns so are $\alpha \cup \alpha', \alpha \cap \alpha', -\alpha$. We can thus extend the meaning v_x in the following manner:

$v_x(\alpha \cup \alpha') = v_x(\alpha) \cup v_x(\alpha'),$

$v_x(\alpha \cap \alpha') = v_x(\alpha) \cap v_x(\alpha')$

$v_x(-\alpha) = -v_x(\alpha)$

Two pronouns α, α' are said to be equivalent iff $v_x(\alpha) = v_x(\alpha')$.

Using this definition of equivalence one can easily show some equivalent pronouns, as for example:

$- I = \text{you} \cup \text{they}$

because

$- x = (C_x - x \quad - C_x) = - x$

In a similar way one can easily prove for example that:

$\text{we} \cap I = I$

$\text{we} \cup I = \text{we}$

$\text{you} \cup I = \text{we}$

$\text{you} \cap I = \phi$

$\text{we} - I = \text{you}$

$\text{they} \cup \text{we} = X$

$\text{they} \cap \text{we} = \phi$

$- \text{you. p} = -(\text{they} - I),$

$- \text{we} = \text{they}$

assuming that each word is spoken by the same person x.

This method may be also used to define a meaning of more complex linguistic structures.