A Special Ordering For Mixed Logic-Systems

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1. The Basic Definition.

All of the material in this short article is relative to that which appears in Herrmann (2004). Let $\mathbf{L}$ be any, at least, denumerable set that represents a language embedded into the standard superstructure $\mathcal{M}$. Let $1 \leq n \in \mathbb{N}$, $[1,n] = \{k \mid (k \in \mathbb{N}) \wedge (1 \leq k \leq n)\}$, and $f\colon [1,n] \to \mathbf{L}$, injection $g\colon [1,n] \to {}^*\mathbf{L}$, $h\colon [1,n] \to \mathbf{L}$ and for each $i, j \in [1,n]$, $f(i) \neq h(j)$, $g(i) \in {}^*\mathbf{L} - \mathbf{L}$. The functions f, h can be formed informally prior to embedding them into the standard superstructure $\mathcal{M}$. Due to the finite domain and range of the functions f, h and the identification process, it follows that we can consider ${}^*f = f$, ${}^*h = h$ and, notationally, for each $i \in [1,n]$, $f(i) = \mathbf{a}_i$, $g(i) = \lambda_i$ [resp.γ_i], $h(i) = \mathbf{b}_i$. Consider the same definitions for f', g', h' and $\mathbf{a}'_i$, λ'_i, $\mathbf{b}'_i$, respectively, but use $n' \in \mathbb{N}$, $1 \leq n'$. Of course, the hyper-form can be retained. The ternary relation $R = \{(\mathbf{a}_k, \lambda_k, \mathbf{b}_k) \mid k \in [1,n]\}$ is internal being a finite collection of internal objects and it is not a member of the superstructure $\mathcal{M}$. Note that, due to the stated f and h properties, such logic-systems as R and used in Herrmann (2004) have been simplified for certain applications.

By considering possible repetitions of the $\mathrm{a_j}$ and corresponding $\mathrm{b_j}$ as these members are embedded into $\mathbf{L}$ and represented in the standard superstructure $\mathcal{M}$ via the partial sequences f, h a special type of ordering can be defined. For either theorem in Herrmann (2004), the mixed logic-systems and the corresponding pure ultralogics are not utilized for any other aspect of the GGU-model. The following special ordering does not yield any mechanism but rather deals with a characteristic that can be considering as a type of "weighting" in the scientific sense. It yields a measure for an "influencing process." The idea is similar to the notion that "repetition" of a statement is a form of linguistic emphasis.

Definition 1. Consider mixed logic-systems R and $R' = \{(\mathbf{a}'_k, \lambda'_k, \mathbf{b}'_k) \mid k \in [1,n']\}$. Let $R_1 = \{(\mathbf{a}_{j_k}, \lambda_{j_k}, \mathbf{b}_{j_k}) \mid k \in [1,m]\} \subset R$, where j is the subsequence map defined on $[1,m]$ and $R_2 = \{(\mathbf{a}'_{i_k}, \lambda'_{i_k}, \mathbf{b}'_{i_k}) \mid k \in [1,m']\} \subset R'$, and i is the subsequence map defined on $[1,m']$. For the projection maps p_1, p_3, let $p_1(R_1) = \{\mathbf{a}_{j_k}\}$, $p_3(R_1) = \{\mathbf{a}_{j_k}\}$, $p_1(R_2) = \{\mathbf{a}'_{j_k}\}$ and $p_3(R_2) = \{\mathbf{b}'_{j_k}\}$ Then the *influencing process* is stronger for $\mathrm{b}'_{\mathrm{i}_1}$ than for $\mathrm{b}_{\mathrm{j}_1}$ if $m' > m$. [Note. Obviously, the λ_k, $k \in [1,m]$ and the λ'_k, $k \in [1,m']$ are distinct.]

Definition 2. Consider mixed logic-systems $R = \{(\lambda_k, \mathbf{b}_k) \mid k \in [1,n]\}$, $R' = \{(\lambda'_k, \mathbf{b}'_k) \mid k \in [1,n']\}$. Let $R_1 = \{(\lambda_{j_k}, \mathbf{b}_{j_k}) \mid k \in [1,m]\} \subset R$, where j is the subsequence map defined on $[1,m]$. Let $R_2 = \{\lambda'_{i_k}, \mathbf{b}'_{i_k}) \mid k \in [1,m']\} \subset R'$, where i is the subsequence map defined on $[1,m']$. For the projection map p_2, let $p_2(R_1) = \{\mathbf{b}_{j_k}\}$ and $p_2(R_2) = \{\mathbf{b}'_{j_k}\}$. Then the *influencing process* is stronger for $\mathrm{b}'_{\mathrm{i}_1}$ than for $\mathrm{b}_{\mathrm{j}_1}$ if $m' > m$.

In applications of definitions 1 and 2, the emphasis produced by the repeated members is not, from the viewpoint of the ultralogic operators, an actual perceived "repetition." It has been "emphasized" by some other means. For example, let internal $X = \{\mathbf{a}_{j_k}, \lambda_{j_k} \mid k \in [1,m]\}$, $X' = \{a'_{i_k}, \lambda'_{i_k} \mid k \in [1,m']\}$ and the corresponding R_1 and R_2 satisfy the requirements of Definition 1. Then for ultralogics C, C' of Theorem 1 and its proof (Herrmann, 2004), it follows that $C(X) - X = \{\mathbf{b}_{j_1}\}$, $C'(X') - X = \{\mathbf{b}'_{i_1}\}$. Thus, if $m' > m$, then the stronger influencing process is more relative to "how" $\mathrm{b}'_{\mathrm{i}_1}$ is perceived mentally.

References

Herrmann, Robert A. (2004). "Nonstandard consequence operators generated by mixed logic-systems" http://arxiv.org/abs/math/0412562