Groups: Toward a Theory of Plural Embodiment

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1 Backgrounds

1.1 Key Features of Groups

Members–Times Groups can have different members at different times

Members–Worlds Groups can have different members across worlds

Existence–Times Groups can exist at one time without existing at every time

Existence–Worlds Groups can exist at one world without existing at every world

Coincidence Groups of the same basic kind can be extensionally coincident and non-identical

1.2 Prominent Views

Views	Members–Times	Members–Worlds	Existence–Times	Existence–Worlds	Coincidence
Pluralities of individuals	No	No	Yes	Yes	No
Fusions	Yes	Yes	Yes	Yes	No
Sets	Yes	Yes	?	?	?

2 Fine's Theory of Embodiment

2.1 Rigid Embodiment

Rigid Existence If some material objects $a, b, ...$ stand in relation R at some world-time, then there is a rigid embodiment $a, b, .../R$, which exists at a world-time if and only if $a, b, ...$ stand in R at the world-time.

Rigid Identity Rigid Identity: The rigid embodiment $a, b, .../R$ is the same as the rigid embodiment $a', b',.../R_0$ if and only if $a = a', b = b', ...$ and R is the same as R'.

The inconsistency 1.There is a property N which an object instantiates iff it embodies a property that it does not instantiate.

2.Some thing m instantiates N.

3.By 1, 2, and Existence, there is a rigidembodiment m/N.

4.m/N instantiates N iff m/N does not instantiate N.

Over and above X is nothing-over-and-above the Ys: X is not an additional ontological commitment relative to the ontological commitment to the Ys.

3 Rigid Plural Embodiment

Rigid Plural Existence: If some material objects mm satisfy a plural condition A at a world-time, then there are **some** material objects mm/A, which exist at a world-time iff mm satisfy R at the worldtime.

3.1 Formal Framework

equivalence $\equiv$:co-extension. $==$:identity

plural comprehension $\exists x A(x) \to \exists xx \forall x(x < xx \leftrightarrow A(x))$

(Compare with set comprehension)

plural extentionality $xx \equiv yy \to A(xx) \leftrightarrow A(yy)$

Indiscernbility $\overline{xx} == \overline{yy} \rightarrow (A(\overline{xx}) \leftrightarrow A(\overline{yy}))$

NNE $\Box\forall\alpha\Box\exists\beta(\alpha = \beta)$

Existence Predicate Necessitist:read Ea as "a has concrete existence".

Contingentist:read Ea as "a has absolute existence".

R-existence $\forall xx((Exx \wedge A(xx)) \rightarrow \exists\overline{xx}(\overline{xx} \equiv xx \wedge \Box(E\overline{xx} \leftrightarrow (Exx \wedge A(xx)))))$

Note:There is no reason to expect the relevant qua-object to figure in the range of individual variables.

R-identity $\overline{xx} == \overline{yy} \leftrightarrow \overline{xx} \equiv \overline{yy} \wedge \Box(E\overline{xx} \leftrightarrow E\overline{yy})$

R-parthood $\alpha \leq_R \beta \leftrightarrow \alpha \ll \beta \wedge \Box(E\beta \rightarrow Ea)$ leq_R is reflexivity,transitivity and anti-symmetry.

proper part $\alpha <_R \beta := \alpha \leq_R \beta \wedge \neg\alpha == \beta$

overlap $\alpha \circ_R \beta := \exists\gamma(\gamma \leq_R \alpha \wedge \gamma \leq_R \beta)$

weak supplementation $a \leq_R \beta \rightarrow \exists\gamma(\gamma \leq_R \beta \wedge \neg\gamma \circ_R \alpha)$

strong supplementation $xx \nleq_R yy \rightarrow \exists zz(zz \leq_R xx \wedge \neg zz \circ_R yy)$

Unrestricted Fusion $\exists\alpha\phi(\alpha) \rightarrow \exists\alpha(\forall\beta(\phi(\beta) \rightarrow \beta \leq \alpha) \wedge \forall\beta(\beta \leq \alpha \rightarrow \exists\gamma(\phi(\gamma) \wedge \beta \circ \gamma)))$

Rigid plural embodiment is not bound by this principle.Therefore not bound by classical mereology.

4 Variable Plural Embodiment

If F is a functional plural condition, then there is a variable embodiment $/F/$, which exists at a world-time if, and only if, F is satisfied by at most one bare plurality mm of material objects at the world-time. Moreover, $/F/$ is, at a worldtime w, constituted by the rigid embodiment mm/F, which consists of the individuals mm that F map to w as they exemplify condition F at the world-time in question.