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Ehrenfeucht's Example shows that there are complete theories with $n = 3, 4, 5, \ldots$ many isomorphism types of countable models.

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It is proved by showing that if $1 < I(T, \aleph_0) \le \aleph_0$, then T has an atomic model, A, a nonisomorphic ω -saturated model, S,

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It is proved by showing that if $1 < I(T, \aleph_0) \le \aleph_0$, then T has an atomic model, A, a nonisomorphic ω -saturated model, S, and a model B that is neither atomic nor ω -saturated.

Stage 1: T is small, hence has a countably infinite ω -saturated model S.

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- Stage 4: The expansion S_a is an ω -saturated model of $T_a := Th(S_a)$,

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Stage 5: Aut(S) does not act oligomorphically on S,

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Stage 6: The reduct \mathbf{B} of $\mathbf{B}_{\mathbf{b}}$ to L cannot be isomorphic to \mathbf{A} ,

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Stage 6: The reduct **B** of $\mathbf{B}_{\mathbf{b}}$ to *L* cannot be isomorphic to **A**, since the type of $\mathbf{b} \in \mathbf{B}^n$ is nonisolated.

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Stage 6: The reduct **B** of $\mathbf{B}_{\mathbf{b}}$ to *L* cannot be isomorphic to **A**, since the type of $\mathbf{b} \in \mathbf{B}^n$ is nonisolated.

Stage 7: The reduct \mathbf{B} of $\mathbf{B}_{\mathbf{b}}$ to L also cannot be isomorphic to \mathbf{S} .

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Stage 3: There must exist $\mathbf{a} \in \mathbf{S}^n$ whose type is not isolated.

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Stage 6: The reduct **B** of $\mathbf{B}_{\mathbf{b}}$ to *L* cannot be isomorphic to **A**, since the type of $\mathbf{b} \in \mathbf{B}^n$ is nonisolated.

Stage 7: The reduct **B** of $\mathbf{B}_{\mathbf{b}}$ to *L* also cannot be isomorphic to **S**. Since $\mathbf{B}_{\mathbf{b}}$ is not an ω -saturated model of $T_{\mathbf{a}}$.

Stage 1: T is small, hence has a countably infinite ω -saturated model S.

Stage 2: T must also have a countably infinite atomic model A, and $A \not\cong S$.

Stage 3: There must exist $\mathbf{a} \in \mathbf{S}^n$ whose type is not isolated.

Stage 4: The expansion S_a is an ω -saturated model of $T_a := \text{Th}(S_a)$, which is a small theory. (The theory of any weakly saturated model is small.) Hence T_a has a countably infinite atomic model B_b .

Stage 5: Aut(S) does not act oligomorphically on S, so the subgroup Aut(S_a) cannot act oligomorphically on S_a. Hence T_a is not ω -categorical. Hence S_a $\not\cong$ B_b. Hence B_b is not an ω -saturated model of T_a .

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Reformulated Conjecture. If T is a complete theory in a countable language and all type spaces $S_n(T)$ are scattered, then T has countably many isomorphism types of countable models.

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Theorem. If T is a complete theory in a countable language, and κ is uncountable, then $I(T, \kappa) = 1$ implies that $I(T, \aleph_0) = 1$ or $I(T, \aleph_0) = \aleph_0$.

In particular, if $S_n(T)$ is uncountable for some n, then T is not κ -categorical for any infinite κ .

A related result:

Morley's Other Theorem. If T is a complete theory in a countable language, and $\kappa \leq \kappa'$ are uncountable, then $I(T, \kappa) = 1$ if and only if $I(T, \kappa') = 1$.

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