

L-HO-IRT Mplus Model Code

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TITLE: Longitudinal Hierarchical IRT Estimation
DATA: FILE IS hsim11111.dat;
VARIABLE: NAMES ARE it1_1 it2_1 it3_1 it4_1 it5_1
it6_1 it7_1 it8_1 it9_1 it10_1 it11_1 it12_1 it13_1 it14_1 it15_1
it16_1 it17_1 it18_1 it19_1 it20_1 it21_1 it22_1 it23_1 it24_1 it25_1
it26_1 it27_1 it28_1 it29_1 it30_1 it31_1 it32_1 it33_1 it34_1 it35_1
it36_1 it37_1 it38_1 it39_1 it40_1 it41_1 it42_1 it43_1 it44_1 it45_1
it46_1 it47_1 it48_1 it49_1 it50_1 it51_1 it52_1 it53_1 it54_1 it55_1
it56_1 it57_1 it58_1 it59_1 it60_1
it1_2 it2_2 it3_2 it4_2 it5_2 it6_2 it7_2 it8_2 it9_2 it10_2
it11_2 it12_2 it13_2 it14_2 it15_2 it16_2 it17_2 it18_2 it19_2 it20_2
it21_2 it22_2 it23_2 it24_2 it25_2 it26_2 it27_2 it28_2 it29_2 it30_2
it31_2 it32_2 it33_2 it34_2 it35_2 it36_2 it37_2 it38_2 it39_2 it40_2
it41_2 it42_2 it43_2 it44_2 it45_2 it46_2 it47_2 it48_2 it49_2 it50_2
it51_2 it52_2 it53_2 it54_2 it55_2 it56_2 it57_2 it58_2 it59_2 it60_2
it1_3 it2_3 it3_3 it4_3 it5_3 it6_3 it7_3 it8_3 it9_3 it10_3
it11_3 it12_3 it13_3 it14_3 it15_3 it16_3 it17_3 it18_3 it19_3 it20_3
it21_3 it22_3 it23_3 it24_3 it25_3 it26_3 it27_3 it28_3 it29_3 it30_3
it31_3 it32_3 it33_3 it34_3 it35_3 it36_3 it37_3 it38_3 it39_3 it40_3
it41_3 it42_3 it43_3 it44_3 it45_3 it46_3 it47_3 it48_3 it49_3 it50_3
it51_3 it52_3 it53_3 it54_3 it55_3 it56_3 it57_3 it58_3 it59_3 it60_3
it1_4 it2_4 it3_4 it4_4 it5_4 it6_4 it7_4 it8_4 it9_4 it10_4
it11_4 it12_4 it13_4 it14_4 it15_4 it16_4 it17_4 it18_4 it19_4 it20_4
it21_4 it22_4 it23_4 it24_4 it25_4 it26_4 it27_4 it28_4 it29_4 it30_4
it31_4 it32_4 it33_4 it34_4 it35_4 it36_4 it37_4 it38_4 it39_4 it40_4
it41_4 it42_4 it43_4 it44_4 it45_4 it46_4 it47_4 it48_4 it49_4 it50_4
it51_4 it52_4 it53_4 it54_4 it55_4 it56_4 it57_4 it58_4 it59_4 it60_4;
CATEGORICAL ARE it1_1 it2_1 it3_1 it4_1 it5_1
it6_1 it7_1 it8_1 it9_1 it10_1 it11_1 it12_1 it13_1 it14_1 it15_1
it16_1 it17_1 it18_1 it19_1 it20_1 it21_1 it22_1 it23_1 it24_1 it25_1
it26_1 it27_1 it28_1 it29_1 it30_1 it31_1 it32_1 it33_1 it34_1 it35_1
it36_1 it37_1 it38_1 it39_1 it40_1 it41_1 it42_1 it43_1 it44_1 it45_1
it46_1 it47_1 it48_1 it49_1 it50_1 it51_1 it52_1 it53_1 it54_1 it55_1
it56_1 it57_1 it58_1 it59_1 it60_1
it1_2 it2_2 it3_2 it4_2 it5_2 it6_2 it7_2 it8_2 it9_2 it10_2
it11_2 it12_2 it13_2 it14_2 it15_2 it16_2 it17_2 it18_2 it19_2 it20_2
it21_2 it22_2 it23_2 it24_2 it25_2 it26_2 it27_2 it28_2 it29_2 it30_2
it31_2 it32_2 it33_2 it34_2 it35_2 it36_2 it37_2 it38_2 it39_2 it40_2
it41_2 it42_2 it43_2 it44_2 it45_2 it46_2 it47_2 it48_2 it49_2 it50_2
it51_2 it52_2 it53_2 it54_2 it55_2 it56_2 it57_2 it58_2 it59_2 it60_2
it1_3 it2_3 it3_3 it4_3 it5_3 it6_3 it7_3 it8_3 it9_3 it10_3
it11_3 it12_3 it13_3 it14_3 it15_3 it16_3 it17_3 it18_3 it19_3 it20_3
it21_3 it22_3 it23_3 it24_3 it25_3 it26_3 it27_3 it28_3 it29_3 it30_3
it31_3 it32_3 it33_3 it34_3 it35_3 it36_3 it37_3 it38_3 it39_3 it40_3
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it41_3 it42_3 it43_3 it44_3 it45_3 it46_3 it47_3 it48_3 it49_3 it50_3
it51_3 it52_3 it53_3 it54_3 it55_3 it56_3 it57_3 it58_3 it59_3 it60_3
it1_4 it2_4 it3_4 it4_4 it5_4 it6_4 it7_4 it8_4 it9_4 it10_4
it11_4 it12_4 it13_4 it14_4 it15_4 it16_4 it17_4 it18_4 it19_4 it20_4
it21_4 it22_4 it23_4 it24_4 it25_4 it26_4 it27_4 it28_4 it29_4 it30_4
it31_4 it32_4 it33_4 it34_4 it35_4 it36_4 it37_4 it38_4 it39_4 it40_4
it41_4 it42_4 it43_4 it44_4 it45_4 it46_4 it47_4 it48_4 it49_4 it50_4
it51_4 it52_4 it53_4 it54_4 it55_4 it56_4 it57_4 it58_4 it59_4 it60_4;
ANALYSIS:
TYPE = GENERAL;
ESTIMATOR = BAYES;
CHAINS = 1;
FBITER = 10000;
POINT = MEAN;
MODEL: th1_1 BY it1_1* it2_1* it3_1* it4_1* it5_1* (f1 f2 f3 f4 f5)
      it6_1* it7_1* it8_1* it9_1* it10_1* (f6 f7 f8 f9 f10)
      it11_1* it12_1* it13_1* it14_1* it15_1* (f11 f12 f13 f14 f15);
th2_1 BY it16_1* it17_1* it18_1* it19_1* it20_1* (f16 f17 f18 f19 f20)
      it21_1* it22_1* it23_1* it24_1* it25_1* (f21 f22 f23 f24 f25)
      it26_1* it27_1* it28_1* it29_1* it30_1* (f26 f27 f28 f29 f30);
th3_1 BY it31_1* it32_1* it33_1* it34_1* it35_1* (f31 f32 f33 f34 f35)
      it36_1* it37_1* it38_1* it39_1* it40_1* (f36 f37 f38 f39 f40)
      it41_1* it42_1* it43_1* it44_1* it45_1* (f41 f42 f43 f44 f45);
th4_1 BY it46_1* it47_1* it48_1* it49_1* it50_1* (f46 f47 f48 f49 f50)
      it51_1* it52_1* it53_1* it54_1* it55_1* (f51 f52 f53 f54 f55)
      it56_1* it57_1* it58_1* it59_1* it60_1* (f56 f57 f58 f59 f60);
th1_2 BY it1_2* it2_2* it3_2* it4_2* it5_2* (f1 f2 f3 f4 f5)
      it6_2* it7_2* it8_2* it9_2* it10_2* (f6 f7 f8 f9 f10)
      it11_2* it12_2* it13_2* it14_2* it15_2* (f11 f12 f13 f14 f15);
th2_2 BY it16_2* it17_2* it18_2* it19_2* it20_2* (f16 f17 f18 f19 f20)
      it21_2* it22_2* it23_2* it24_2* it25_2* (f21 f22 f23 f24 f25)
      it26_2* it27_2* it28_2* it29_2* it30_2* (f26 f27 f28 f29 f30);
th3_2 BY it31_2* it32_2* it33_2* it34_2* it35_2* (f31 f32 f33 f34 f35)
      it36_2* it37_2* it38_2* it39_2* it40_2* (f36 f37 f38 f39 f40)
      it41_2* it42_2* it43_2* it44_2* it45_2* (f41 f42 f43 f44 f45);
th4_2 BY it46_2* it47_2* it48_2* it49_2* it50_2* (f46 f47 f48 f49 f50)
      it51_2* it52_2* it53_2* it54_2* it55_2* (f51 f52 f53 f54 f55)
      it56_2* it57_2* it58_2* it59_2* it60_2* (f56 f57 f58 f59 f60);
th1_3 BY it1_3* it2_3* it3_3* it4_3* it5_3* (f1 f2 f3 f4 f5)
      it6_3* it7_3* it8_3* it9_3* it10_3* (f6 f7 f8 f9 f10)
      it11_3* it12_3* it13_3* it14_3* it15_3* (f11 f12 f13 f14 f15);
th2_3 BY it16_3* it17_3* it18_3* it19_3* it20_3* (f16 f17 f18 f19 f20)
      it21_3* it22_3* it23_3* it24_3* it25_3* (f21 f22 f23 f24 f25)
      it26_3* it27_3* it28_3* it29_3* it30_3* (f26 f27 f28 f29 f30);
th3_3 BY it31_3* it32_3* it33_3* it34_3* it35_3* (f31 f32 f33 f34 f35)
      it36_3* it37_3* it38_3* it39_3* it40_3* (f36 f37 f38 f39 f40)

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it41_3* it42_3* it43_3* it44_3* it45_3* (f41 f42 f43 f44 f45);
th4_3 BY it46_3* it47_3* it48_3* it49_3* it50_3* (f46 f47 f48 f49 f50)
it51_3* it52_3* it53_3* it54_3* it55_3* (f51 f52 f53 f54 f55)
it56_3* it57_3* it58_3* it59_3* it60_3* (f56 f57 f58 f59 f60);
th1_4 BY it1_4* it2_4* it3_4* it4_4* it5_4* (f1 f2 f3 f4 f5)
it6_4* it7_4* it8_4* it9_4* it10_4* (f6 f7 f8 f9 f10)
it11_4* it12_4* it13_4* it14_4* it15_4* (f11 f12 f13 f14 f15);
th2_4 BY it16_4* it17_4* it18_4* it19_4* it20_4* (f16 f17 f18 f19 f20)
it21_4* it22_4* it23_4* it24_4* it25_4* (f21 f22 f23 f24 f25)
it26_4* it27_4* it28_4* it29_4* it30_4* (f26 f27 f28 f29 f30);
th3_4 BY it31_4* it32_4* it33_4* it34_4* it35_4* (f31 f32 f33 f34 f35)
it36_4* it37_4* it38_4* it39_4* it40_4* (f36 f37 f38 f39 f40)
it41_4* it42_4* it43_4* it44_4* it45_4* (f41 f42 f43 f44 f45);
th4_4 BY it46_4* it47_4* it48_4* it49_4* it50_4* (f46 f47 f48 f49 f50)
it51_4* it52_4* it53_4* it54_4* it55_4* (f51 f52 f53 f54 f55)
it56_4* it57_4* it58_4* it59_4* it60_4* (f56 f57 f58 f59 f60);
xi1 BY th1_1@0.54772 (lamb1)
th2_1*0.54772 th3_1*0.54772 th4_1*0.54772 (lamb2 lamb3 lamb4);
xi2 BY th1_2@0.54772 (lamb1)
th2_2*0.54772 th3_2*0.54772 th4_2*0.54772 (lamb2 lamb3 lamb4);
xi3 BY th1_3@0.54772 (lamb1)
th2_3*0.54772 th3_3*0.54772 th4_3*0.54772 (lamb2 lamb3 lamb4);
xi4 BY th1_4@0.54772 (lamb1)
th2_4*0.54772 th3_4*0.54772 th4_4*0.54772 (lamb2 lamb3 lamb4);
[it1_1$1 it2_1$1 it3_1$1 it4_1$1 it5_1$1] (f61 f62 f63 f64 f65);
[it6_1$1 it7_1$1 it8_1$1 it9_1$1 it10_1$1] (f66 f67 f68 f69 f70);
[it11_1$1 it12_1$1 it13_1$1 it14_1$1 it15_1$1] (f71 f72 f73 f74 f75);
[it16_1$1 it17_1$1 it18_1$1 it19_1$1 it20_1$1] (f76 f77 f78 f79 f80);
[it21_1$1 it22_1$1 it23_1$1 it24_1$1 it25_1$1] (f81 f82 f83 f84 f85);
[it26_1$1 it27_1$1 it28_1$1 it29_1$1 it30_1$1] (f86 f87 f88 f89 f90);
[it31_1$1 it32_1$1 it33_1$1 it34_1$1 it35_1$1] (f91 f92 f93 f94 f95);
[it36_1$1 it37_1$1 it38_1$1 it39_1$1 it40_1$1] (f96 f97 f98 f99 f100);
[it41_1$1 it42_1$1 it43_1$1 it44_1$1 it45_1$1] (f101 f102 f103 f104 f105);
[it46_1$1 it47_1$1 it48_1$1 it49_1$1 it50_1$1] (f106 f107 f108 f109 f110);
[it51_1$1 it52_1$1 it53_1$1 it54_1$1 it55_1$1] (f111 f112 f113 f114 f115);
[it56_1$1 it57_1$1 it58_1$1 it59_1$1 it60_1$1] (f116 f117 f118 f119 f120);
[it1_2$1 it2_2$1 it3_2$1 it4_2$1 it5_2$1] (f61 f62 f63 f64 f65);
[it6_2$1 it7_2$1 it8_2$1 it9_2$1 it10_2$1] (f66 f67 f68 f69 f70);
[it11_2$1 it12_2$1 it13_2$1 it14_2$1 it15_2$1] (f71 f72 f73 f74 f75);
[it16_2$1 it17_2$1 it18_2$1 it19_2$1 it20_2$1] (f76 f77 f78 f79 f80);
[it21_2$1 it22_2$1 it23_2$1 it24_2$1 it25_2$1] (f81 f82 f83 f84 f85);
[it26_2$1 it27_2$1 it28_2$1 it29_2$1 it30_2$1] (f86 f87 f88 f89 f90);
[it31_2$1 it32_2$1 it33_2$1 it34_2$1 it35_2$1] (f91 f92 f93 f94 f95);
[it36_2$1 it37_2$1 it38_2$1 it39_2$1 it40_2$1] (f96 f97 f98 f99 f100);
[it41_2$1 it42_2$1 it43_2$1 it44_2$1 it45_2$1] (f101 f102 f103 f104 f105);
[it46_2$1 it47_2$1 it48_2$1 it49_2$1 it50_2$1] (f106 f107 f108 f109 f110);

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[it51_2$1 it52_2$1 it53_2$1 it54_2$1 it55_2$1] (f111 f112 f113 f114 f115);
[it56_2$1 it57_2$1 it58_2$1 it59_2$1 it60_2$1] (f116 f117 f118 f119 f120);
[it1_3$1 it2_3$1 it3_3$1 it4_3$1 it5_3$1] (f61 f62 f63 f64 f65);
[it6_3$1 it7_3$1 it8_3$1 it9_3$1 it10_3$1] (f66 f67 f68 f69 f70);
[it11_3$1 it12_3$1 it13_3$1 it14_3$1 it15_3$1] (f71 f72 f73 f74 f75);
[it16_3$1 it17_3$1 it18_3$1 it19_3$1 it20_3$1] (f76 f77 f78 f79 f80);
[it21_3$1 it22_3$1 it23_3$1 it24_3$1 it25_3$1] (f81 f82 f83 f84 f85);
[it26_3$1 it27_3$1 it28_3$1 it29_3$1 it30_3$1] (f86 f87 f88 f89 f90);
[it31_3$1 it32_3$1 it33_3$1 it34_3$1 it35_3$1] (f91 f92 f93 f94 f95);
[it36_3$1 it37_3$1 it38_3$1 it39_3$1 it40_3$1] (f96 f97 f98 f99 f100);
[it41_3$1 it42_3$1 it43_3$1 it44_3$1 it45_3$1] (f101 f102 f103 f104 f105);
[it46_3$1 it47_3$1 it48_3$1 it49_3$1 it50_3$1] (f106 f107 f108 f109 f110);
[it51_3$1 it52_3$1 it53_3$1 it54_3$1 it55_3$1] (f111 f112 f113 f114 f115);
[it56_3$1 it57_3$1 it58_3$1 it59_3$1 it60_3$1] (f116 f117 f118 f119 f120);
[it1_4$1 it2_4$1 it3_4$1 it4_4$1 it5_4$1] (f61 f62 f63 f64 f65);
[it6_4$1 it7_4$1 it8_4$1 it9_4$1 it10_4$1] (f66 f67 f68 f69 f70);
[it11_4$1 it12_4$1 it13_4$1 it14_4$1 it15_4$1] (f71 f72 f73 f74 f75);
[it16_4$1 it17_4$1 it18_4$1 it19_4$1 it20_4$1] (f76 f77 f78 f79 f80);
[it21_4$1 it22_4$1 it23_4$1 it24_4$1 it25_4$1] (f81 f82 f83 f84 f85);
[it26_4$1 it27_4$1 it28_4$1 it29_4$1 it30_4$1] (f86 f87 f88 f89 f90);
[it31_4$1 it32_4$1 it33_4$1 it34_4$1 it35_4$1] (f91 f92 f93 f94 f95);
[it36_4$1 it37_4$1 it38_4$1 it39_4$1 it40_4$1] (f96 f97 f98 f99 f100);
[it41_4$1 it42_4$1 it43_4$1 it44_4$1 it45_4$1] (f101 f102 f103 f104 f105);
[it46_4$1 it47_4$1 it48_4$1 it49_4$1 it50_4$1] (f106 f107 f108 f109 f110);
[it51_4$1 it52_4$1 it53_4$1 it54_4$1 it55_4$1] (f111 f112 f113 f114 f115);
[it56_4$1 it57_4$1 it58_4$1 it59_4$1 it60_4$1] (f116 f117 f118 f119 f120);
[th1_1-th4_1@0];
[th1_2-th4_2@0];
[th1_3-th4_3@0];
[th1_4-th4_4@0];
th1_1@0.7000028016 th2_1@0.7000028016 th3_1@0.7000028016 th4_1@0.7000028016;
th1_2*0.7000028016 th2_2*0.7000028016 th3_2*0.7000028016 th4_2*0.7000028016;
th1_3*0.7000028016 th2_3*0.7000028016 th3_3*0.7000028016 th4_3*0.7000028016;
th1_4*0.7000028016 th2_4*0.7000028016 th3_4*0.7000028016 th4_4*0.7000028016;
[xi1@0];
[xi2@0];
[xi3@0];
[xi4@0];
xi1-xi4*.1 (vxi);
int slp | xi1@0 xi2@1 xi3@2 xi4@3;
[int@0];
int*.5;
slp*.1;
int WITH slp@0;
OUTPUT: TECH1, TECH4, TECH8;
SAVEDATA: FILE IS hsim11111_higher.sav; SAVE = FSCORES (100);

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PLOT: TYPE = PLOT3;

L-MIRT Mplus Model Code

```
TITLE: Longitudinal IRT Estimation
DATA: FILE IS hsim11111.dat;
VARIABLE: NAMES ARE it1_1 it2_1 it3_1 it4_1 it5_1
it6_1 it7_1 it8_1 it9_1 it10_1 it11_1 it12_1 it13_1 it14_1 it15_1
it16_1 it17_1 it18_1 it19_1 it20_1 it21_1 it22_1 it23_1 it24_1 it25_1
it26_1 it27_1 it28_1 it29_1 it30_1 it31_1 it32_1 it33_1 it34_1 it35_1
it36_1 it37_1 it38_1 it39_1 it40_1 it41_1 it42_1 it43_1 it44_1 it45_1
it46_1 it47_1 it48_1 it49_1 it50_1 it51_1 it52_1 it53_1 it54_1 it55_1
it56_1 it57_1 it58_1 it59_1 it60_1
it1_2 it2_2 it3_2 it4_2 it5_2 it6_2 it7_2 it8_2 it9_2 it10_2
it11_2 it12_2 it13_2 it14_2 it15_2 it16_2 it17_2 it18_2 it19_2 it20_2
it21_2 it22_2 it23_2 it24_2 it25_2 it26_2 it27_2 it28_2 it29_2 it30_2
it31_2 it32_2 it33_2 it34_2 it35_2 it36_2 it37_2 it38_2 it39_2 it40_2
it41_2 it42_2 it43_2 it44_2 it45_2 it46_2 it47_2 it48_2 it49_2 it50_2
it51_2 it52_2 it53_2 it54_2 it55_2 it56_2 it57_2 it58_2 it59_2 it60_2
it1_3 it2_3 it3_3 it4_3 it5_3 it6_3 it7_3 it8_3 it9_3 it10_3
it11_3 it12_3 it13_3 it14_3 it15_3 it16_3 it17_3 it18_3 it19_3 it20_3
it21_3 it22_3 it23_3 it24_3 it25_3 it26_3 it27_3 it28_3 it29_3 it30_3
it31_3 it32_3 it33_3 it34_3 it35_3 it36_3 it37_3 it38_3 it39_3 it40_3
it41_3 it42_3 it43_3 it44_3 it45_3 it46_3 it47_3 it48_3 it49_3 it50_3
it51_3 it52_3 it53_3 it54_3 it55_3 it56_3 it57_3 it58_3 it59_3 it60_3
it1_4 it2_4 it3_4 it4_4 it5_4 it6_4 it7_4 it8_4 it9_4 it10_4
it11_4 it12_4 it13_4 it14_4 it15_4 it16_4 it17_4 it18_4 it19_4 it20_4
it21_4 it22_4 it23_4 it24_4 it25_4 it26_4 it27_4 it28_4 it29_4 it30_4
it31_4 it32_4 it33_4 it34_4 it35_4 it36_4 it37_4 it38_4 it39_4 it40_4
it41_4 it42_4 it43_4 it44_4 it45_4 it46_4 it47_4 it48_4 it49_4 it50_4
it51_4 it52_4 it53_4 it54_4 it55_4 it56_4 it57_4 it58_4 it59_4 it60_4;
CATEGORICAL ARE it1_1 it2_1 it3_1 it4_1 it5_1
it6_1 it7_1 it8_1 it9_1 it10_1 it11_1 it12_1 it13_1 it14_1 it15_1
it16_1 it17_1 it18_1 it19_1 it20_1 it21_1 it22_1 it23_1 it24_1 it25_1
it26_1 it27_1 it28_1 it29_1 it30_1 it31_1 it32_1 it33_1 it34_1 it35_1
it36_1 it37_1 it38_1 it39_1 it40_1 it41_1 it42_1 it43_1 it44_1 it45_1
it46_1 it47_1 it48_1 it49_1 it50_1 it51_1 it52_1 it53_1 it54_1 it55_1
it56_1 it57_1 it58_1 it59_1 it60_1
it1_2 it2_2 it3_2 it4_2 it5_2 it6_2 it7_2 it8_2 it9_2 it10_2
it11_2 it12_2 it13_2 it14_2 it15_2 it16_2 it17_2 it18_2 it19_2 it20_2
it21_2 it22_2 it23_2 it24_2 it25_2 it26_2 it27_2 it28_2 it29_2 it30_2
it31_2 it32_2 it33_2 it34_2 it35_2 it36_2 it37_2 it38_2 it39_2 it40_2
it41_2 it42_2 it43_2 it44_2 it45_2 it46_2 it47_2 it48_2 it49_2 it50_2
it51_2 it52_2 it53_2 it54_2 it55_2 it56_2 it57_2 it58_2 it59_2 it60_2
it1_3 it2_3 it3_3 it4_3 it5_3 it6_3 it7_3 it8_3 it9_3 it10_3
it11_3 it12_3 it13_3 it14_3 it15_3 it16_3 it17_3 it18_3 it19_3 it20_3
it21_3 it22_3 it23_3 it24_3 it25_3 it26_3 it27_3 it28_3 it29_3 it30_3
it31_3 it32_3 it33_3 it34_3 it35_3 it36_3 it37_3 it38_3 it39_3 it40_3
```

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it41_3 it42_3 it43_3 it44_3 it45_3 it46_3 it47_3 it48_3 it49_3 it50_3
it51_3 it52_3 it53_3 it54_3 it55_3 it56_3 it57_3 it58_3 it59_3 it60_3
it1_4 it2_4 it3_4 it4_4 it5_4 it6_4 it7_4 it8_4 it9_4 it10_4
it11_4 it12_4 it13_4 it14_4 it15_4 it16_4 it17_4 it18_4 it19_4 it20_4
it21_4 it22_4 it23_4 it24_4 it25_4 it26_4 it27_4 it28_4 it29_4 it30_4
it31_4 it32_4 it33_4 it34_4 it35_4 it36_4 it37_4 it38_4 it39_4 it40_4
it41_4 it42_4 it43_4 it44_4 it45_4 it46_4 it47_4 it48_4 it49_4 it50_4
it51_4 it52_4 it53_4 it54_4 it55_4 it56_4 it57_4 it58_4 it59_4 it60_4;
ANALYSIS:
TYPE = GENERAL;
ESTIMATOR = BAYES;
CHAINS = 1;
FBITER = 10000;
POINT = MEAN;
MODEL: th1_1 BY it1_1* it2_1* it3_1* it4_1* it5_1* (f1 f2 f3 f4 f5)
      it6_1* it7_1* it8_1* it9_1* it10_1* (f6 f7 f8 f9 f10)
      it11_1* it12_1* it13_1* it14_1* it15_1* (f11 f12 f13 f14 f15);
th2_1 BY it16_1* it17_1* it18_1* it19_1* it20_1* (f16 f17 f18 f19 f20)
      it21_1* it22_1* it23_1* it24_1* it25_1* (f21 f22 f23 f24 f25)
      it26_1* it27_1* it28_1* it29_1* it30_1* (f26 f27 f28 f29 f30);
th3_1 BY it31_1* it32_1* it33_1* it34_1* it35_1* (f31 f32 f33 f34 f35)
      it36_1* it37_1* it38_1* it39_1* it40_1* (f36 f37 f38 f39 f40)
      it41_1* it42_1* it43_1* it44_1* it45_1* (f41 f42 f43 f44 f45);
th4_1 BY it46_1* it47_1* it48_1* it49_1* it50_1* (f46 f47 f48 f49 f50)
      it51_1* it52_1* it53_1* it54_1* it55_1* (f51 f52 f53 f54 f55)
      it56_1* it57_1* it58_1* it59_1* it60_1* (f56 f57 f58 f59 f60);
th1_2 BY it1_2* it2_2* it3_2* it4_2* it5_2* (f1 f2 f3 f4 f5)
      it6_2* it7_2* it8_2* it9_2* it10_2* (f6 f7 f8 f9 f10)
      it11_2* it12_2* it13_2* it14_2* it15_2* (f11 f12 f13 f14 f15);
th2_2 BY it16_2* it17_2* it18_2* it19_2* it20_2* (f16 f17 f18 f19 f20)
      it21_2* it22_2* it23_2* it24_2* it25_2* (f21 f22 f23 f24 f25)
      it26_2* it27_2* it28_2* it29_2* it30_2* (f26 f27 f28 f29 f30);
th3_2 BY it31_2* it32_2* it33_2* it34_2* it35_2* (f31 f32 f33 f34 f35)
      it36_2* it37_2* it38_2* it39_2* it40_2* (f36 f37 f38 f39 f40)
      it41_2* it42_2* it43_2* it44_2* it45_2* (f41 f42 f43 f44 f45);
th4_2 BY it46_2* it47_2* it48_2* it49_2* it50_2* (f46 f47 f48 f49 f50)
      it51_2* it52_2* it53_2* it54_2* it55_2* (f51 f52 f53 f54 f55)
      it56_2* it57_2* it58_2* it59_2* it60_2* (f56 f57 f58 f59 f60);
th1_3 BY it1_3* it2_3* it3_3* it4_3* it5_3* (f1 f2 f3 f4 f5)
      it6_3* it7_3* it8_3* it9_3* it10_3* (f6 f7 f8 f9 f10)
      it11_3* it12_3* it13_3* it14_3* it15_3* (f11 f12 f13 f14 f15);
th2_3 BY it16_3* it17_3* it18_3* it19_3* it20_3* (f16 f17 f18 f19 f20)
      it21_3* it22_3* it23_3* it24_3* it25_3* (f21 f22 f23 f24 f25)
      it26_3* it27_3* it28_3* it29_3* it30_3* (f26 f27 f28 f29 f30);
th3_3 BY it31_3* it32_3* it33_3* it34_3* it35_3* (f31 f32 f33 f34 f35)
      it36_3* it37_3* it38_3* it39_3* it40_3* (f36 f37 f38 f39 f40)

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it41_3* it42_3* it43_3* it44_3* it45_3* (f41 f42 f43 f44 f45);
th4_3 BY it46_3* it47_3* it48_3* it49_3* it50_3* (f46 f47 f48 f49 f50)
it51_3* it52_3* it53_3* it54_3* it55_3* (f51 f52 f53 f54 f55)
it56_3* it57_3* it58_3* it59_3* it60_3* (f56 f57 f58 f59 f60);
th1_4 BY it1_4* it2_4* it3_4* it4_4* it5_4* (f1 f2 f3 f4 f5)
it6_4* it7_4* it8_4* it9_4* it10_4* (f6 f7 f8 f9 f10)
it11_4* it12_4* it13_4* it14_4* it15_4* (f11 f12 f13 f14 f15);
th2_4 BY it16_4* it17_4* it18_4* it19_4* it20_4* (f16 f17 f18 f19 f20)
it21_4* it22_4* it23_4* it24_4* it25_4* (f21 f22 f23 f24 f25)
it26_4* it27_4* it28_4* it29_4* it30_4* (f26 f27 f28 f29 f30);
th3_4 BY it31_4* it32_4* it33_4* it34_4* it35_4* (f31 f32 f33 f34 f35)
it36_4* it37_4* it38_4* it39_4* it40_4* (f36 f37 f38 f39 f40)
it41_4* it42_4* it43_4* it44_4* it45_4* (f41 f42 f43 f44 f45);
th4_4 BY it46_4* it47_4* it48_4* it49_4* it50_4* (f46 f47 f48 f49 f50)
it51_4* it52_4* it53_4* it54_4* it55_4* (f51 f52 f53 f54 f55)
it56_4* it57_4* it58_4* it59_4* it60_4* (f56 f57 f58 f59 f60);
[it1_1$1 it2_1$1 it3_1$1 it4_1$1 it5_1$1] (f61 f62 f63 f64 f65);
[it6_1$1 it7_1$1 it8_1$1 it9_1$1 it10_1$1] (f66 f67 f68 f69 f70);
[it11_1$1 it12_1$1 it13_1$1 it14_1$1 it15_1$1] (f71 f72 f73 f74 f75);
[it16_1$1 it17_1$1 it18_1$1 it19_1$1 it20_1$1] (f76 f77 f78 f79 f80);
[it21_1$1 it22_1$1 it23_1$1 it24_1$1 it25_1$1] (f81 f82 f83 f84 f85);
[it26_1$1 it27_1$1 it28_1$1 it29_1$1 it30_1$1] (f86 f87 f88 f89 f90);
[it31_1$1 it32_1$1 it33_1$1 it34_1$1 it35_1$1] (f91 f92 f93 f94 f95);
[it36_1$1 it37_1$1 it38_1$1 it39_1$1 it40_1$1] (f96 f97 f98 f99 f100);
[it41_1$1 it42_1$1 it43_1$1 it44_1$1 it45_1$1] (f101 f102 f103 f104 f105);
[it46_1$1 it47_1$1 it48_1$1 it49_1$1 it50_1$1] (f106 f107 f108 f109 f110);
[it51_1$1 it52_1$1 it53_1$1 it54_1$1 it55_1$1] (f111 f112 f113 f114 f115);
[it56_1$1 it57_1$1 it58_1$1 it59_1$1 it60_1$1] (f116 f117 f118 f119 f120);
[it1_2$1 it2_2$1 it3_2$1 it4_2$1 it5_2$1] (f61 f62 f63 f64 f65);
[it6_2$1 it7_2$1 it8_2$1 it9_2$1 it10_2$1] (f66 f67 f68 f69 f70);
[it11_2$1 it12_2$1 it13_2$1 it14_2$1 it15_2$1] (f71 f72 f73 f74 f75);
[it16_2$1 it17_2$1 it18_2$1 it19_2$1 it20_2$1] (f76 f77 f78 f79 f80);
[it21_2$1 it22_2$1 it23_2$1 it24_2$1 it25_2$1] (f81 f82 f83 f84 f85);
[it26_2$1 it27_2$1 it28_2$1 it29_2$1 it30_2$1] (f86 f87 f88 f89 f90);
[it31_2$1 it32_2$1 it33_2$1 it34_2$1 it35_2$1] (f91 f92 f93 f94 f95);
[it36_2$1 it37_2$1 it38_2$1 it39_2$1 it40_2$1] (f96 f97 f98 f99 f100);
[it41_2$1 it42_2$1 it43_2$1 it44_2$1 it45_2$1] (f101 f102 f103 f104 f105);
[it46_2$1 it47_2$1 it48_2$1 it49_2$1 it50_2$1] (f106 f107 f108 f109 f110);
[it51_2$1 it52_2$1 it53_2$1 it54_2$1 it55_2$1] (f111 f112 f113 f114 f115);
[it56_2$1 it57_2$1 it58_2$1 it59_2$1 it60_2$1] (f116 f117 f118 f119 f120);
[it1_3$1 it2_3$1 it3_3$1 it4_3$1 it5_3$1] (f61 f62 f63 f64 f65);
[it6_3$1 it7_3$1 it8_3$1 it9_3$1 it10_3$1] (f66 f67 f68 f69 f70);
[it11_3$1 it12_3$1 it13_3$1 it14_3$1 it15_3$1] (f71 f72 f73 f74 f75);
[it16_3$1 it17_3$1 it18_3$1 it19_3$1 it20_3$1] (f76 f77 f78 f79 f80);
[it21_3$1 it22_3$1 it23_3$1 it24_3$1 it25_3$1] (f81 f82 f83 f84 f85);
[it26_3$1 it27_3$1 it28_3$1 it29_3$1 it30_3$1] (f86 f87 f88 f89 f90);

```



```

[it31_3$1 it32_3$1 it33_3$1 it34_3$1 it35_3$1] (f91 f92 f93 f94 f95);
[it36_3$1 it37_3$1 it38_3$1 it39_3$1 it40_3$1] (f96 f97 f98 f99 f100);
[it41_3$1 it42_3$1 it43_3$1 it44_3$1 it45_3$1] (f101 f102 f103 f104 f105);
[it46_3$1 it47_3$1 it48_3$1 it49_3$1 it50_3$1] (f106 f107 f108 f109 f110);
[it51_3$1 it52_3$1 it53_3$1 it54_3$1 it55_3$1] (f111 f112 f113 f114 f115);
[it56_3$1 it57_3$1 it58_3$1 it59_3$1 it60_3$1] (f116 f117 f118 f119 f120);
[it1_4$1 it2_4$1 it3_4$1 it4_4$1 it5_4$1] (f61 f62 f63 f64 f65);
[it6_4$1 it7_4$1 it8_4$1 it9_4$1 it10_4$1] (f66 f67 f68 f69 f70);
[it11_4$1 it12_4$1 it13_4$1 it14_4$1 it15_4$1] (f71 f72 f73 f74 f75);
[it16_4$1 it17_4$1 it18_4$1 it19_4$1 it20_4$1] (f76 f77 f78 f79 f80);
[it21_4$1 it22_4$1 it23_4$1 it24_4$1 it25_4$1] (f81 f82 f83 f84 f85);
[it26_4$1 it27_4$1 it28_4$1 it29_4$1 it30_4$1] (f86 f87 f88 f89 f90);
[it31_4$1 it32_4$1 it33_4$1 it34_4$1 it35_4$1] (f91 f92 f93 f94 f95);
[it36_4$1 it37_4$1 it38_4$1 it39_4$1 it40_4$1] (f96 f97 f98 f99 f100);
[it41_4$1 it42_4$1 it43_4$1 it44_4$1 it45_4$1] (f101 f102 f103 f104 f105);
[it46_4$1 it47_4$1 it48_4$1 it49_4$1 it50_4$1] (f106 f107 f108 f109 f110);
[it51_4$1 it52_4$1 it53_4$1 it54_4$1 it55_4$1] (f111 f112 f113 f114 f115);
[it56_4$1 it57_4$1 it58_4$1 it59_4$1 it60_4$1] (f116 f117 f118 f119 f120);
[th1_1-th4_1@0];
[th1_2-th4_2@0];
[th1_3-th4_3@0];
[th1_4-th4_4@0];
th1_1@0.71499985992 th2_1@0.71499985992 th3_1@0.71499985992 th4_1@0.71499985992;
th1_2*0.71499985992 th2_2*0.71499985992 th3_2*0.71499985992 th4_2*0.71499985992;
th1_3*0.71499985992 th2_3*0.71499985992 th3_3*0.71499985992 th4_3*0.71499985992;
th1_4*0.71499985992 th2_4*0.71499985992 th3_4*0.71499985992 th4_4*0.71499985992;
int1 slp1 | th1_1@0 th1_2@1 th1_3@2 th1_4@3;
int2 slp2 | th2_1@0 th2_2@1 th2_3@2 th2_4@3;
int3 slp3 | th3_1@0 th3_2@1 th3_3@2 th3_4@3;
int4 slp4 | th4_1@0 th4_2@1 th4_3@2 th4_4@3;
[int1@0];
[int2@0];
[int3@0];
[int4@0];
int1*.5;
int2*.5;
int3*.5;
int4*.5;
slp1*.1;
slp2*.1;
slp3*.1;
slp4*.1;
int1 WITH slp1@0;
int2 WITH slp1@0;
int3 WITH slp1@0;
int4 WITH slp1@0;

```

```
int1 WITH slp2@0;  
int2 WITH slp2@0;  
int3 WITH slp2@0;  
int4 WITH slp2@0;  
int1 WITH slp3@0;  
int2 WITH slp3@0;  
int3 WITH slp3@0;  
int4 WITH slp3@0;  
int1 WITH slp4@0;  
int2 WITH slp4@0;  
int3 WITH slp4@0;  
int4 WITH slp4@0;  
int1*.5;  
int1*.5;  
int1*.5;  
int2*.5;  
int2*.5;  
int3*.5;  
int2*.5;  
int3*.5;  
int4*.5;  
int3*.5;  
int4*.5;  
int4*.5;  
slp1*.5;  
slp1*.5;  
slp1*.5;  
slp2*.5;  
slp2*.5;  
slp3*.5;  
slp2*.5;  
slp3*.5;  
slp4*.5;  
slp3*.5;  
slp4*.5;  
slp4*.5;  
OUTPUT: TECH1, TECH4, TECH8;  
SAVEDATA: FILE IS hsim11111_lower.sav; SAVE = FSCORES (100);  
PLOT: TYPE = PLOT3;
```

L-UIRT Mplus Model Code

```
TITLE: Longitudinal IRT Estimation
DATA: FILE IS hsim11111.dat;
VARIABLE: NAMES ARE it1_1 it2_1 it3_1 it4_1 it5_1
it6_1 it7_1 it8_1 it9_1 it10_1 it11_1 it12_1 it13_1 it14_1 it15_1
it16_1 it17_1 it18_1 it19_1 it20_1 it21_1 it22_1 it23_1 it24_1 it25_1
it26_1 it27_1 it28_1 it29_1 it30_1 it31_1 it32_1 it33_1 it34_1 it35_1
it36_1 it37_1 it38_1 it39_1 it40_1 it41_1 it42_1 it43_1 it44_1 it45_1
it46_1 it47_1 it48_1 it49_1 it50_1 it51_1 it52_1 it53_1 it54_1 it55_1
it56_1 it57_1 it58_1 it59_1 it60_1
it1_2 it2_2 it3_2 it4_2 it5_2 it6_2 it7_2 it8_2 it9_2 it10_2
it11_2 it12_2 it13_2 it14_2 it15_2 it16_2 it17_2 it18_2 it19_2 it20_2
it21_2 it22_2 it23_2 it24_2 it25_2 it26_2 it27_2 it28_2 it29_2 it30_2
it31_2 it32_2 it33_2 it34_2 it35_2 it36_2 it37_2 it38_2 it39_2 it40_2
it41_2 it42_2 it43_2 it44_2 it45_2 it46_2 it47_2 it48_2 it49_2 it50_2
it51_2 it52_2 it53_2 it54_2 it55_2 it56_2 it57_2 it58_2 it59_2 it60_2
it1_3 it2_3 it3_3 it4_3 it5_3 it6_3 it7_3 it8_3 it9_3 it10_3
it11_3 it12_3 it13_3 it14_3 it15_3 it16_3 it17_3 it18_3 it19_3 it20_3
it21_3 it22_3 it23_3 it24_3 it25_3 it26_3 it27_3 it28_3 it29_3 it30_3
it31_3 it32_3 it33_3 it34_3 it35_3 it36_3 it37_3 it38_3 it39_3 it40_3
it41_3 it42_3 it43_3 it44_3 it45_3 it46_3 it47_3 it48_3 it49_3 it50_3
it51_3 it52_3 it53_3 it54_3 it55_3 it56_3 it57_3 it58_3 it59_3 it60_3
it1_4 it2_4 it3_4 it4_4 it5_4 it6_4 it7_4 it8_4 it9_4 it10_4
it11_4 it12_4 it13_4 it14_4 it15_4 it16_4 it17_4 it18_4 it19_4 it20_4
it21_4 it22_4 it23_4 it24_4 it25_4 it26_4 it27_4 it28_4 it29_4 it30_4
it31_4 it32_4 it33_4 it34_4 it35_4 it36_4 it37_4 it38_4 it39_4 it40_4
it41_4 it42_4 it43_4 it44_4 it45_4 it46_4 it47_4 it48_4 it49_4 it50_4
it51_4 it52_4 it53_4 it54_4 it55_4 it56_4 it57_4 it58_4 it59_4 it60_4;
CATEGORICAL ARE it1_1 it2_1 it3_1 it4_1 it5_1
it6_1 it7_1 it8_1 it9_1 it10_1 it11_1 it12_1 it13_1 it14_1 it15_1
it16_1 it17_1 it18_1 it19_1 it20_1 it21_1 it22_1 it23_1 it24_1 it25_1
it26_1 it27_1 it28_1 it29_1 it30_1 it31_1 it32_1 it33_1 it34_1 it35_1
it36_1 it37_1 it38_1 it39_1 it40_1 it41_1 it42_1 it43_1 it44_1 it45_1
it46_1 it47_1 it48_1 it49_1 it50_1 it51_1 it52_1 it53_1 it54_1 it55_1
it56_1 it57_1 it58_1 it59_1 it60_1
it1_2 it2_2 it3_2 it4_2 it5_2 it6_2 it7_2 it8_2 it9_2 it10_2
it11_2 it12_2 it13_2 it14_2 it15_2 it16_2 it17_2 it18_2 it19_2 it20_2
it21_2 it22_2 it23_2 it24_2 it25_2 it26_2 it27_2 it28_2 it29_2 it30_2
it31_2 it32_2 it33_2 it34_2 it35_2 it36_2 it37_2 it38_2 it39_2 it40_2
it41_2 it42_2 it43_2 it44_2 it45_2 it46_2 it47_2 it48_2 it49_2 it50_2
it51_2 it52_2 it53_2 it54_2 it55_2 it56_2 it57_2 it58_2 it59_2 it60_2
it1_3 it2_3 it3_3 it4_3 it5_3 it6_3 it7_3 it8_3 it9_3 it10_3
it11_3 it12_3 it13_3 it14_3 it15_3 it16_3 it17_3 it18_3 it19_3 it20_3
it21_3 it22_3 it23_3 it24_3 it25_3 it26_3 it27_3 it28_3 it29_3 it30_3
it31_3 it32_3 it33_3 it34_3 it35_3 it36_3 it37_3 it38_3 it39_3 it40_3
```

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it41_3 it42_3 it43_3 it44_3 it45_3 it46_3 it47_3 it48_3 it49_3 it50_3
it51_3 it52_3 it53_3 it54_3 it55_3 it56_3 it57_3 it58_3 it59_3 it60_3
it1_4 it2_4 it3_4 it4_4 it5_4 it6_4 it7_4 it8_4 it9_4 it10_4
it11_4 it12_4 it13_4 it14_4 it15_4 it16_4 it17_4 it18_4 it19_4 it20_4
it21_4 it22_4 it23_4 it24_4 it25_4 it26_4 it27_4 it28_4 it29_4 it30_4
it31_4 it32_4 it33_4 it34_4 it35_4 it36_4 it37_4 it38_4 it39_4 it40_4
it41_4 it42_4 it43_4 it44_4 it45_4 it46_4 it47_4 it48_4 it49_4 it50_4
it51_4 it52_4 it53_4 it54_4 it55_4 it56_4 it57_4 it58_4 it59_4 it60_4;
ANALYSIS:
TYPE = GENERAL;
ESTIMATOR = BAYES;
CHAINS = 1;
FBITER = 10000;
POINT = MEAN;
MODEL: th1_1 BY it1_1* it2_1* it3_1* it4_1* it5_1* (f1 f2 f3 f4 f5)
      it6_1* it7_1* it8_1* it9_1* it10_1* (f6 f7 f8 f9 f10)
      it11_1* it12_1* it13_1* it14_1* it15_1* (f11 f12 f13 f14 f15)
      it16_1* it17_1* it18_1* it19_1* it20_1* (f16 f17 f18 f19 f20)
      it21_1* it22_1* it23_1* it24_1* it25_1* (f21 f22 f23 f24 f25)
      it26_1* it27_1* it28_1* it29_1* it30_1* (f26 f27 f28 f29 f30)
      it31_1* it32_1* it33_1* it34_1* it35_1* (f31 f32 f33 f34 f35)
      it36_1* it37_1* it38_1* it39_1* it40_1* (f36 f37 f38 f39 f40)
      it41_1* it42_1* it43_1* it44_1* it45_1* (f41 f42 f43 f44 f45)
      it46_1* it47_1* it48_1* it49_1* it50_1* (f46 f47 f48 f49 f50)
      it51_1* it52_1* it53_1* it54_1* it55_1* (f51 f52 f53 f54 f55)
      it56_1* it57_1* it58_1* it59_1* it60_1* (f56 f57 f58 f59 f60);
th1_2 BY it1_2* it2_2* it3_2* it4_2* it5_2* (f1 f2 f3 f4 f5)
      it6_2* it7_2* it8_2* it9_2* it10_2* (f6 f7 f8 f9 f10)
      it11_2* it12_2* it13_2* it14_2* it15_2* (f11 f12 f13 f14 f15)
      it16_2* it17_2* it18_2* it19_2* it20_2* (f16 f17 f18 f19 f20)
      it21_2* it22_2* it23_2* it24_2* it25_2* (f21 f22 f23 f24 f25)
      it26_2* it27_2* it28_2* it29_2* it30_2* (f26 f27 f28 f29 f30)
      it31_2* it32_2* it33_2* it34_2* it35_2* (f31 f32 f33 f34 f35)
      it36_2* it37_2* it38_2* it39_2* it40_2* (f36 f37 f38 f39 f40)
      it41_2* it42_2* it43_2* it44_2* it45_2* (f41 f42 f43 f44 f45)
      it46_2* it47_2* it48_2* it49_2* it50_2* (f46 f47 f48 f49 f50)
      it51_2* it52_2* it53_2* it54_2* it55_2* (f51 f52 f53 f54 f55)
      it56_2* it57_2* it58_2* it59_2* it60_2* (f56 f57 f58 f59 f60);
th1_3 BY it1_3* it2_3* it3_3* it4_3* it5_3* (f1 f2 f3 f4 f5)
      it6_3* it7_3* it8_3* it9_3* it10_3* (f6 f7 f8 f9 f10)
      it11_3* it12_3* it13_3* it14_3* it15_3* (f11 f12 f13 f14 f15)
      it16_3* it17_3* it18_3* it19_3* it20_3* (f16 f17 f18 f19 f20)
      it21_3* it22_3* it23_3* it24_3* it25_3* (f21 f22 f23 f24 f25)
      it26_3* it27_3* it28_3* it29_3* it30_3* (f26 f27 f28 f29 f30)
      it31_3* it32_3* it33_3* it34_3* it35_3* (f31 f32 f33 f34 f35)
      it36_3* it37_3* it38_3* it39_3* it40_3* (f36 f37 f38 f39 f40)

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it41_3* it42_3* it43_3* it44_3* it45_3* (f41 f42 f43 f44 f45)
it46_3* it47_3* it48_3* it49_3* it50_3* (f46 f47 f48 f49 f50)
it51_3* it52_3* it53_3* it54_3* it55_3* (f51 f52 f53 f54 f55)
it56_3* it57_3* it58_3* it59_3* it60_3* (f56 f57 f58 f59 f60);
th1_4 BY it1_4* it2_4* it3_4* it4_4* it5_4* (f1 f2 f3 f4 f5)
it6_4* it7_4* it8_4* it9_4* it10_4* (f6 f7 f8 f9 f10)
it11_4* it12_4* it13_4* it14_4* it15_4* (f11 f12 f13 f14 f15)
it16_4* it17_4* it18_4* it19_4* it20_4* (f16 f17 f18 f19 f20)
it21_4* it22_4* it23_4* it24_4* it25_4* (f21 f22 f23 f24 f25)
it26_4* it27_4* it28_4* it29_4* it30_4* (f26 f27 f28 f29 f30)
it31_4* it32_4* it33_4* it34_4* it35_4* (f31 f32 f33 f34 f35)
it36_4* it37_4* it38_4* it39_4* it40_4* (f36 f37 f38 f39 f40)
it41_4* it42_4* it43_4* it44_4* it45_4* (f41 f42 f43 f44 f45)
it46_4* it47_4* it48_4* it49_4* it50_4* (f46 f47 f48 f49 f50)
it51_4* it52_4* it53_4* it54_4* it55_4* (f51 f52 f53 f54 f55)
it56_4* it57_4* it58_4* it59_4* it60_4* (f56 f57 f58 f59 f60);
[it1_1$1 it2_1$1 it3_1$1 it4_1$1 it5_1$1] (f61 f62 f63 f64 f65);
[it6_1$1 it7_1$1 it8_1$1 it9_1$1 it10_1$1] (f66 f67 f68 f69 f70);
[it11_1$1 it12_1$1 it13_1$1 it14_1$1 it15_1$1] (f71 f72 f73 f74 f75);
[it16_1$1 it17_1$1 it18_1$1 it19_1$1 it20_1$1] (f76 f77 f78 f79 f80);
[it21_1$1 it22_1$1 it23_1$1 it24_1$1 it25_1$1] (f81 f82 f83 f84 f85);
[it26_1$1 it27_1$1 it28_1$1 it29_1$1 it30_1$1] (f86 f87 f88 f89 f90);
[it31_1$1 it32_1$1 it33_1$1 it34_1$1 it35_1$1] (f91 f92 f93 f94 f95);
[it36_1$1 it37_1$1 it38_1$1 it39_1$1 it40_1$1] (f96 f97 f98 f99 f100);
[it41_1$1 it42_1$1 it43_1$1 it44_1$1 it45_1$1] (f101 f102 f103 f104 f105);
[it46_1$1 it47_1$1 it48_1$1 it49_1$1 it50_1$1] (f106 f107 f108 f109 f110);
[it51_1$1 it52_1$1 it53_1$1 it54_1$1 it55_1$1] (f111 f112 f113 f114 f115);
[it56_1$1 it57_1$1 it58_1$1 it59_1$1 it60_1$1] (f116 f117 f118 f119 f120);
[it1_2$1 it2_2$1 it3_2$1 it4_2$1 it5_2$1] (f61 f62 f63 f64 f65);
[it6_2$1 it7_2$1 it8_2$1 it9_2$1 it10_2$1] (f66 f67 f68 f69 f70);
[it11_2$1 it12_2$1 it13_2$1 it14_2$1 it15_2$1] (f71 f72 f73 f74 f75);
[it16_2$1 it17_2$1 it18_2$1 it19_2$1 it20_2$1] (f76 f77 f78 f79 f80);
[it21_2$1 it22_2$1 it23_2$1 it24_2$1 it25_2$1] (f81 f82 f83 f84 f85);
[it26_2$1 it27_2$1 it28_2$1 it29_2$1 it30_2$1] (f86 f87 f88 f89 f90);
[it31_2$1 it32_2$1 it33_2$1 it34_2$1 it35_2$1] (f91 f92 f93 f94 f95);
[it36_2$1 it37_2$1 it38_2$1 it39_2$1 it40_2$1] (f96 f97 f98 f99 f100);
[it41_2$1 it42_2$1 it43_2$1 it44_2$1 it45_2$1] (f101 f102 f103 f104 f105);
[it46_2$1 it47_2$1 it48_2$1 it49_2$1 it50_2$1] (f106 f107 f108 f109 f110);
[it51_2$1 it52_2$1 it53_2$1 it54_2$1 it55_2$1] (f111 f112 f113 f114 f115);
[it56_2$1 it57_2$1 it58_2$1 it59_2$1 it60_2$1] (f116 f117 f118 f119 f120);
[it1_3$1 it2_3$1 it3_3$1 it4_3$1 it5_3$1] (f61 f62 f63 f64 f65);
[it6_3$1 it7_3$1 it8_3$1 it9_3$1 it10_3$1] (f66 f67 f68 f69 f70);
[it11_3$1 it12_3$1 it13_3$1 it14_3$1 it15_3$1] (f71 f72 f73 f74 f75);
[it16_3$1 it17_3$1 it18_3$1 it19_3$1 it20_3$1] (f76 f77 f78 f79 f80);
[it21_3$1 it22_3$1 it23_3$1 it24_3$1 it25_3$1] (f81 f82 f83 f84 f85);
[it26_3$1 it27_3$1 it28_3$1 it29_3$1 it30_3$1] (f86 f87 f88 f89 f90);

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[it31_3$1 it32_3$1 it33_3$1 it34_3$1 it35_3$1] (f91 f92 f93 f94 f95);
[it36_3$1 it37_3$1 it38_3$1 it39_3$1 it40_3$1] (f96 f97 f98 f99 f100);
[it41_3$1 it42_3$1 it43_3$1 it44_3$1 it45_3$1] (f101 f102 f103 f104 f105);
[it46_3$1 it47_3$1 it48_3$1 it49_3$1 it50_3$1] (f106 f107 f108 f109 f110);
[it51_3$1 it52_3$1 it53_3$1 it54_3$1 it55_3$1] (f111 f112 f113 f114 f115);
[it56_3$1 it57_3$1 it58_3$1 it59_3$1 it60_3$1] (f116 f117 f118 f119 f120);
[it1_4$1 it2_4$1 it3_4$1 it4_4$1 it5_4$1] (f61 f62 f63 f64 f65);
[it6_4$1 it7_4$1 it8_4$1 it9_4$1 it10_4$1] (f66 f67 f68 f69 f70);
[it11_4$1 it12_4$1 it13_4$1 it14_4$1 it15_4$1] (f71 f72 f73 f74 f75);
[it16_4$1 it17_4$1 it18_4$1 it19_4$1 it20_4$1] (f76 f77 f78 f79 f80);
[it21_4$1 it22_4$1 it23_4$1 it24_4$1 it25_4$1] (f81 f82 f83 f84 f85);
[it26_4$1 it27_4$1 it28_4$1 it29_4$1 it30_4$1] (f86 f87 f88 f89 f90);
[it31_4$1 it32_4$1 it33_4$1 it34_4$1 it35_4$1] (f91 f92 f93 f94 f95);
[it36_4$1 it37_4$1 it38_4$1 it39_4$1 it40_4$1] (f96 f97 f98 f99 f100);
[it41_4$1 it42_4$1 it43_4$1 it44_4$1 it45_4$1] (f101 f102 f103 f104 f105);
[it46_4$1 it47_4$1 it48_4$1 it49_4$1 it50_4$1] (f106 f107 f108 f109 f110);
[it51_4$1 it52_4$1 it53_4$1 it54_4$1 it55_4$1] (f111 f112 f113 f114 f115);
[it56_4$1 it57_4$1 it58_4$1 it59_4$1 it60_4$1] (f116 f117 f118 f119 f120);
[th1_1@0];
[th1_2@0];
[th1_3@0];
[th1_4@0];
th1_1@0.05;
th1_2*0.05;
th1_3*0.05;
th1_4*0.05;
int slp | th1_1@0 th1_2@1 th1_3@2 th1_4@3;
[int@0];
int*.5;
slp*.1;
int WITH slp@0;
OUTPUT: TECH1, TECH4, TECH8;
SAVEDATA: FILE IS hsim11111_unidim.sav; SAVE = FSCORES (100);
PLOT: TYPE = PLOT3;

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