

TEST XARAKTERISTIKALARI: GEOGRAFIYA FANIDAN O'TKAZILGAN TEST SINOVLARI

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Qisqacha mazmuni. Mazkur maqolada 2024-yilda geografiya fani bo'yicha milliy sertifikat uchun o'tkazilgan test sinovlari natijalari klassik test nazariyasi va Rash modeli asosida tahlil qilingan. Test sinovi natijalarining tavsif statistikasi va har bitta test topshiriqlariga berilgan javoblarining umumiy ball bilan korrelyatsiyasi muhokama qilingan. Klassik test nazariyasi va Rash modeli bilan o'tkazilgan uchta test sinovida ishlatalgan variantlardagi test topshiriqlarining qiyinlik darajasi tahlil qilingan. Rash modeli asosida aniqlangan qobiliyat va qiyinlik darajalaridan foydalanib, har bir variant uchun Rayt xaritalari olingan. Shuningdek, test ma'lumoti va xarakteristikasi chiziqlari hamda test variantlaridagi har bir test topshirig'ining Rash modeli bilan moslik statistikalari o'r ganilgan.

Kalit so'zlar: Test topshiriqlari, Kronbax alfa koeffitsiyenti, qiyinlik darajasi, korrelyatsiya koeffitsiyenti, Rash modeli, Rayt xaritasi, qobiliyat darajalari, Rash modeli bilan moslik

I. Kirish

"Umumta'lim fanlarini bilish darajasini baholashning milliy test tizimini joriy etish to'g'risida"gi qaroriga asosan Bilim va malakalarni baholash agentligi umumta'lim fanlari bo'yicha milliy sertifikat uchun test sinovlarini tashkil etib kelmoqda.

Milliy sertifikat uchun o'tkaziladigan test sinovlari natijalari klassik test nazariyasi [1-2] hamda zamонавиу nazariyalaridan biri bo'lgan Rash modeli asosida [3-5] tahlil qilinadi va test topshiriqlarining xususiyatlarini optimal holga keltirish

uchun fan mutaxassislariga taklif va tavsiyalar berib boriladi [6-8].

Avvalgi maqolalarimizda [8-14] ham umumta'lim fanlaridan milliy sertifikat uchun o'tkazilgan test sinovlari natijalari bo'yicha testning klassik nazariyasi hamda Rash modeli bilan matematik-statistik tadqiqotlar olib borilgan va tegishli tavsiyalar, xulosalar taqdim qilingan.

Mazkur maqola ham umumta'lim fanlaridan biri bo'lgan geografiya fanidan milliy sertifikat uchun o'tkazilgan test sinovi natijalari haqida

bo'ladi. Ilmiy tadqiqot obyekti sifatida milliy sertifikat uchun geografiya fanidan 2024-yil may (1-test sinovi), oktabr (2-test sinovi) va dekabr (3-test sinovi) oylarida o'tkazilgan test sinovi natijalaridan foydalanildi. Geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-test sinovida 1358 nafar, 2-test sinovida 245 nafar va 3-test sinovida 701 nafar talabgorlar ishtirok etdilar. Test sinovlarida foydalanilgan har bir variant 45 ta (36-45-ochiq test

topshiriqlarining A va B qismlarga ajratilishi hisobiga 55 ta) test topshirig'idan iborat bo'lib, ajratilgan vaqt javoblar varaqasini bo'yash bilan birgalikda 150 daqiqani tashkil qilgan.

Maqolada geografiya fanidan milliy sertifikat uchun o'tkazilgan 3 ta test sinovi natijasi asosida klassik test nazariyasi hamda Rash modeli bilan aniqlangan test xarakteristikalari o'rGANIB chiqilgan.

II. Test sinovlari natijalarining klassik test nazariyasi asosida tahlili

Pedagogik o'lchovlarning nazariy asoslari ko'ra test topshiriqlari mazmuni ekspert tekshiruvidan o'tkazilgandan keyingi bosqichda test sinovlari o'tkaziladi va uning natijalari asosida testlarning xususiyatlari sifatini tashxislash uchun ularning statistik xarakteristikalari aniqlanadi. Testlar statistikada tanlanma to'plam hisoblanadi va u real testlar to'g'risida xulosalar chiqarish imkonini beradi.

Test topshiriqlariga qo'yilgan asosiy talablarning ko'rsatkichlari statistik tavsiflar yordamida aniqlanadi. Unga qo'yiladigan asosiy talablar topshiriqning qiyinligi, test ballarining dispersiyasi (o'zgaruvchanligi, farqlanishi), topshiriqning boshqa topshiriqlar bilan shuningdek, umumiy ballar yig'indisi bilan korrelyatsiyasidan iborat. Berilgan topshiriqning qiyinlik darajasini aniqlash usullaridan biri uni empirik sinovdan o'tkazib, to'g'ri javoblar

salmog'ini aniqlashdan iborat. Test ballarining (yoki to'g'ri javoblarning) dispersiyasi test topshiruvchilarning tayyorgarlik darajasini aniqlashga, bilim darajalari bo'yicha ajratishga imkon beradi.

Test variantlari va test topshiriqlarining asosiy statistik tavsiflari qatoriga o'rta qiymat, histogrammani qurish, moda va mediana kabi ko'rsatkichlarni hisoblash hamda test ballarining umumi dispersiyasi (standart og'ish) ham kiradi [1-2,15-18]. Test ballarining (yoki to'g'ri javoblarning) o'rta arifmetik qiymati fanlar, oliy ta'lim muassasalari va boshqa muhim belgilar kesimida aniqlanadi. Bu ko'rsatkich test ballari o'rtasidagi tafovutlarni umumlashtiradi, ularga xos bo'lgan yo'nalishni, qonuniyatni ochib beradi. Test sinovlari natijalari asosida aniqlangan test ballari taqsimoti histogrammasi quriladi va

uning normal taqsimotga yaqinligi baholanadi. Gistogrammaning normal taqsimotga yaqinligi testning sifatini, test sinovlarining obyektiv o'tkazilganligini bildiradi. Test ballarining eng ko'p takrorlanadigan qiymati statistikada moda, o'sish tartibida joylashtirilgan test ballari qatorining o'rta qiyamiga joylashgan qiymati esa mediana deyiladi. O'rta arifmetik

qiymat, moda va mediana qiymatlari o'zaro teng bo'lganda test ballari taqsimoti simmetrik bo'ladi. Ushbu statistik ko'rsatkichlar biri-biridan qanchalik ko'p farq qilsa, ballar taqsimoti normal taqsimotdan shunchalik uzoqda bo'ladi.

1-jadvalda o'tkazilgan test sinovlari natijalarining tavsif statistikasi ma'lumotlari keltirilgan.

1-jadval

Natijalarining tavsif statistikasi

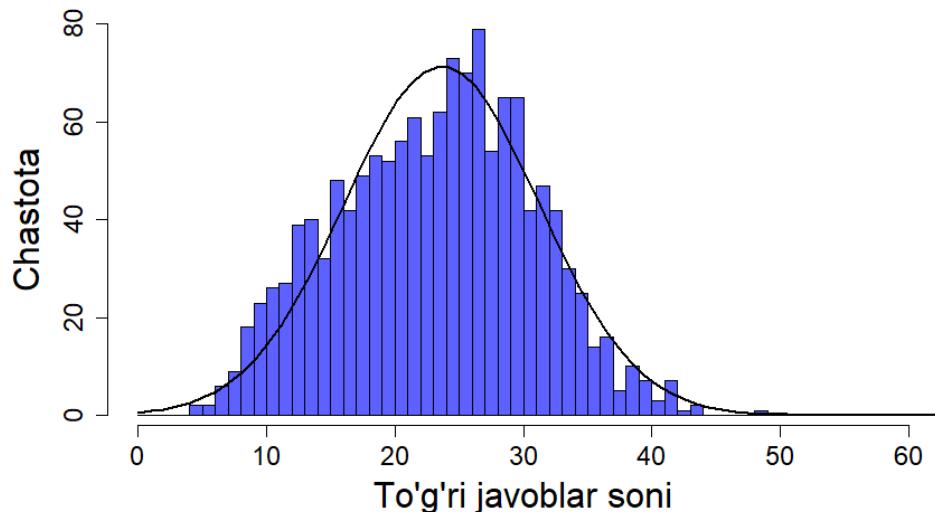
Nº	Test sinovlari	O'rta qiymat	Mediana	Moda	Dispersiya	Kronbax alfa koeffitsiyenti	O'lchashning standart xatoligi
1.	1-test sinovi	23,63	24	27	54,64	0,84	3,04
2.	2-test sinovi	33,28	34	38	56,63	0,84	3,01
3.	3-test sinovi	33,17	35	38	76,39	0,87	3,15

1-jadvalda geografiya fanidan test sinovlari natijalarining tavsif statistikalari, ya'ni test sinovi ballarining o'rta qiymati, medianasi, modasi va dispersiyasi qiymatlari keltirilgan. 1a-, 1b- va 1c-rasmlarda esa ularning gistogrammalari keltirilgan. Gistogrammalardan ko'rinish turibdiki, o'tkazilgan 3 ta test sinovi natijalari bo'yicha test topshiriqlarining individual ballari taqsimoti bir-biriga juda yaqin va normal taqsimotdan juda kam farq qiladi. Statistik tadqiqot natijalariga ko'ra, geografiya fanidan test variantining ishonchlilik koeffitsiyenti, ya'ni Kronbax alfa

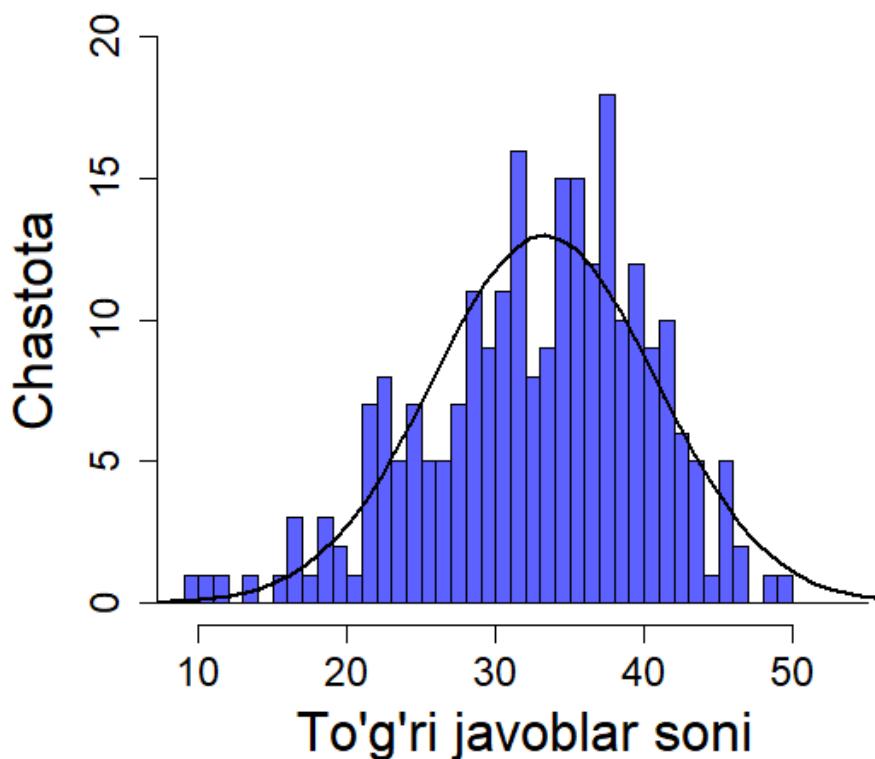
koeffitsiyenti 1-, 2- va 3-test sinovi natijalari bo'yicha mos ravishda 0,84; 0,84 va 0,87 ga teng ekanligi aniqlandi. Kronbax alfa koeffitsiyentining 0,8 va undan kattaligi ushbu test sinovlari uchun tanlab olingan test variantlarining ishonchliligi yaxshi darajada ekanligini ko'rsatmoqda [19]. Test topshiriqlarining ichki muvofiqligi har bitta test topshirig'iga berilgan to'g'ri javoblarining umumiyligi bilan korrelyatsiyasiga, talabgorlar oлган umumiyligi ballarning standart og'ishiga, har bitta test topshirig'iga berilgan javoblarining standart og'ishlari yig'indisiga hamda test topshiriqlari va

test topshiruvchilar soniga bog'liq bo'ladi. Bundan tashqari test topshiriqlarining ichki muvofiqligi nafaqat test topshiriqlarining sifatiga,

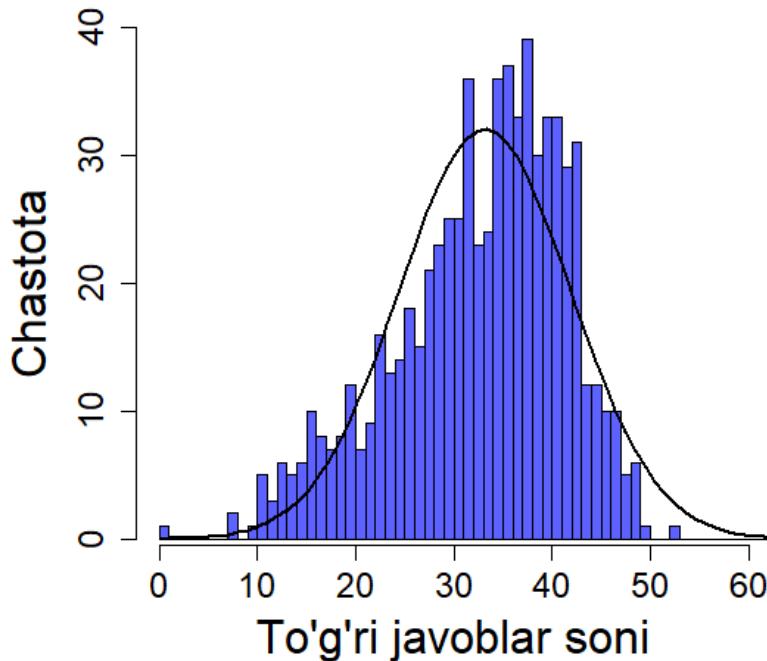
balki talabgorlarning tayyorgarlik darajasining past yoki yuqoriligiga ham bog'liqdir.



1a-rasm. Geografiya fanidan milliy sertifikat uchun o'tkazilgan
1-test sinovi natijalarining histogrammasi



1b-rasm. Geografiya fanidan milliy sertifikat uchun o'tkazilgan
2-test sinovi natijalarining histogrammasi



1c-rasm. Geografiya fanidan milliy sertifikat uchun o'tkazilgan
3-test sinovi natijalarining histogrammasi

Klassik test nazariyasi asosida geografiya fanidan milliy sertifikat uchun o'tkazilgan test sinovi natijalari bo'yicha test topshiriqlarining qiyinlik darajalari aniqlandi. Quyida test topshiriqlari natijalari asosida, test

topshiriqlarining - ID raqami, to'g'ri javob berganlar foizi – Ans (foizda) va test natijalari bo'yicha aniqlangan qiyinlik darajalari V (1-, 2- va 3-qiyinlik darajalari) 2-jadvalda ko'rsatilgan.

2-jadval

Geografiya fanidan milliy sertifikat uchun o'tkazilgan test sinovi natijalari
bo'yicha test topshiriqlarining aniqlangan qiyinlik darajalari

№	1-test sinovi			2-test sinovi			3-test sinovi		
	ID	Ans (foizda)	V	ID	Ans (foizda)	V	ID	Ans (foizda)	V
1.	115548	96,24	1	114169	95,10	1	1073812	92,15	1
2.	115765	85,35	1	107211	91,84	1	107318	91,44	1
3.	115555	84,98	1	107304	91,84	1	113866	87,02	1
4.	115781	80,41	1	113873	89,80	1	107286	86,88	1
5.	115755	78,72	1	107322	88,98	1	112568	86,16	1

6.	115770	75,48	1	112546	87,76	1	107331	85,88	1
7.	115763	69,73	2	112612	85,71	1	114196	83,88	1
8.	115762	69,51	2	107344	84,49	1	112607	82,17	1
9.	115767	69,15	2	112539	84,08	1	114179	80,88	1
10.	115771	68,04	2	113869	83,27	1	112612	79,89	1
11.	115782	67,30	2	107235	80,41	1	107333	77,75	1
12.	115776	66,94	2	113832	79,59	1	107381	77,75	1
13.	115768	66,64	2	107406	79,18	1	107235	77,46	1
14.	1155552	61,27	2	104179	77,14	1	107212	77,32	1
15.	115775	60,97	2	11447433	76,73	1	114115	76,46	1
16.	115783	60,82	2	114099	76,73	1	114193	73,32	2
17.	115772	60,24	2	114126	76,33	1	114191	72,61	2
18.	115754	57,51	2	107391	75,10	1	113848	72,04	2
19.	115759	57,29	2	107331	74,69	2	112616	71,61	2
20.	115780	57,00	2	104183	73,88	2	112592	71,18	2
21.	115756	54,86	2	112562	72,65	2	107190	69,90	2
22.	115758	54,71	2	113847	72,24	2	107230	68,90	2
23.	115777	51,91	2	114474	72,24	2	113851	66,33	2
24.	115550	48,45	2	113861	71,43	2	114125	66,33	2
25.	115786	46,91	2	114116	70,61	2	107339	66,19	2
26.	11575435	46,91	2	112580	68,98	2	107206	63,91	2
27.	115773	44,92	2	104190	66,94	2	107246	60,63	2
28.	115764	44,18	2	112592	66,94	2	112547	59,91	2
29.	115761	41,46	2	107292	66,12	2	107270	57,77	2
30.	115757	39,03	2	107204	64,90	2	1141252	57,63	2
31.	115785	37,19	2	107230	64,49	2	1141712	57,49	2
32.	1155502	35,27	2	114091	63,67	2	1141152	56,06	2
33.	115784	35,05	2	1073912	61,63	2	114132	55,21	2
34.	115769	34,54	2	112600	61,22	2	107376	54,35	2
35.	115779	32,47	2	1141162	59,18	2	107239	53,07	2
36.	115760	31,37	2	114190	55,92	2	1140832	52,64	2
37.	115766	28,94	2	113952	54,69	2	113949	51,36	2
38.	115546	27,39	2	114110	54,29	2	10740935	50,64	2

39.	115551	26,22	2	107341	50,61	2	114171	50,36	2
40.	11575434	24,45	3	114122	49,80	2	113957	48,07	2
41.	115547	21,72	3	1141222	48,16	2	1073762	47,93	2
42.	115554	20,47	3	1141102	46,94	2	107314	46,79	2
43.	115774	20,32	3	11447434	44,49	2	107402	46,79	2
44.	1155482	19,07	3	1141262	40,41	2	107250	45,36	2
45.	1155522	16,13	3	107311	36,73	2	1073672	43,51	2
46.	115778	14,65	3	113955	35,10	2	112560	41,80	2
47.	115552	12,37	3	107316	33,06	2	111033	40,37	2
48.	1155492	11,41	3	112586	31,84	2	107397	37,52	2
49.	1155542	11,27	3	114097	29,39	2	114083	34,95	2
50.	115549	9,13	3	1140992	24,49	3	107367	34,81	2
51.	1155512	7,88	3	1140972	17,14	3	1074022	34,38	2
52.	1155462	6,77	3	1074062	10,20	3	1141322	33,95	2
53.	1155472	4,79	3	1140912	4,08	3	107409	26,39	2
54.	1155532	4,12	3	1141072	2,86	3	10740934	24,68	3
55.	115553	2,80	3	114107	2,04	3	1073972	6,70	3

1-test sinovi natijalari bo'yicha (2-jadval), 55 ta test topshirig'idan 6 tasi (10,91 foiz) 1-qiyinlik darajasidagi test topshirig'idan, 33 tasi (60,00 foiz) 2-qiyinlik darajasidagi test topshirig'idan va 16 tasi (29,09 foiz) 3-qiyinlik darajasidagi test topshirig'idan iborat ekanligi aniqlandi.

1-test sinovida foydalanilgan variantda 1-qiyinlik darajasidagi test topshiriqlari normadan biroz kam, 2-qiyinlik darajasidagi test topshiriqlari normada taqsimlanganligi, 3-qiyinlik darajasidagi test topshiriqlari esa normadan ko'p taqsimlanganligi kuzatildi. ID raqami - 115548 bo'lgan test topshirig'ining qiyinlik

darajasi juda past va ID raqamlari - 1155532 va 115553 bo'lgan test topshiriqlarining qiyinlik darajalari juda yuqori ekanligi ko'rish mumkin.

2-test sinovi natijalari bo'yicha esa (2-jadval), 55 ta test topshirig'idan 18 tasi (32,73 foiz) 1-qiyinlik darajasidagi test topshirig'idan, 31 tasi (56,36 foiz) 2-qiyinlik darajasidagi test topshirig'idan va 6 tasi (10,91 foiz) 3-qiyinlik darajasidagi test topshirig'idan iborat ekanligi aniqlandi.

2-test sinovida foydalanilgan variantda 1-qiyinlik darajasidagi test topshiriqlari normadan ko'p taqsimlanganligi, 2-qiyinlik darajasidagi test topshiriqlari esa normada

taqsimlanganligi va 3-qiyinlik darajasidagi test topshiriqlari esa normadan biroz kam taqsimlanganligi kuzatildi. ID raqamlari - 114169, 107211 va 107304 bo'lgan test topshiriqlarining qiyinlik darajasi juda past va ID raqamlari - 1140912, 1141072 va 114107 bo'lgan test topshiriqlarining qiyinlik darajalari esa juda yuqori ekanligi aniqlandi.

3-test sinovi natijalari bo'yicha esa (2-jadval), 55 ta test topshiriqlaridan 15 tasi (27,27 foiz) 1-qiyinlik darajasidagi test topshiriqlaridan, 38 tasi (69,10 foiz) 2-qiyinlik darajasidagi test topshiriqlaridan va 2 tasi (3,63 foiz) 3-qiyinlik darajasidagi test topshiriqlaridan iborat ekanligi aniqlandi.

3-test sinovida foydalanilgan variantda 1- va 2-qiyinlik darajasidagi test topshiriqlari normadan biroz ko'p taqsimlanganligi va 3-qiyinlik darajasidagi test topshiriqlari normadan juda kam taqsimlanganligi kuzatildi. ID raqamlari- 1073812 va 107318 bo'lgan test topshiriqlarining qiyinlik darajasi juda past va ID raqami - 1073972 bo'lgan test topshirig'ining qiyinlik darajasi esa juda yuqori ekanligi aniqlandi.

Klassik test nazariyasi bo'yicha test topshiriqlarining normal taqsimotini ta'minlash uchun, 1- va 3-darajali test topshiriqlari sonini test variantidagi test topshiriqlari sonining 16-25 (9-14 ta) foizi, 2-darajali test topshiriqlari sonini esa 50-68 (27-37

ta) foiz qilib olish maqsadga muvofiq bo'ladi.

Geografiya fanidan milliy sertifikat uchun o'tkazilgan test sinovida test topshiriqlarining ichki muvofiqligi har bitta test topshirig'iga berilgan to'g'ri javoblarning umumiyligi bilan korrelyatsiyasiga, talabgorlar olgan umumiyligi ballarning standart og'ishiga, har bitta test topshirig'iga berilgan javoblarning standart og'ishlari yig'indisiga hamda test topshiriqlari va test topshiruvchilar soniga bog'liq bo'ladi. Bundan tashqari test topshiriqlarining ichki muvofiqligi nafaqat test topshiriqlarining sifatiga, balki talabgorlarning tayyorgarlik darajasining past yoki yuqoriligidagi ham bog'liqdir.

Har bitta test topshirig'iga berilgan javoblarning umumiyligi test ballarning korrelyatsiyasi shu test topshirig'ining qobiliyatlarni qanchalik yaxshi ajaratishini bildiradi.

Umuman olganda, umumiyligi ball bilan korrelyatsiya koeffitsiyenti qiymati 2-qiyinlik darajasidagi test topshiriqlari uchun 0,5 va undan katta bo'lsa, 1- va 3-qiyinlik darajasidagi test topshiriqlari uchun esa 0,25 va undan katta bo'lsa valid hisoblanadi. Umumiyligi ball bilan korrelyatsiya koeffitsiyenti qiymati manfiy bo'lgan test topshiriqlari esa variantdan chiqariladi. Aks holda bilim darajalari past bo'lgan talabgorlar g'olib bo'lib, bilim darajalari yuqori bo'lgan talabgorlar test topshiriqlarini yechishda noto'g'ri

javobni tanlaydilar yoki ularni o'tkazib yuboradilar. 3-jadvalda 1-, 2- va 3-test sinovi natijalari tahlili asosida olingan test topshiriqlarining umumiyl ball bilan korrelyatsiya koeffitsiyenti (UBBKK) qiymatlari qiyinlik darajalari ortib borishi tartibida keltirilgan. Statistik tadqiqotlar natijalariga ko'ra 1-test sinovida foydalanilgan test topshiriqlarining 14 tasining (3-jadvalning 1-test sinovi qismida ajratib ko'rsatilgan ID raqamlari - 115548, 115776, 115758, 115784, 115769, 115779, 115760, 11575434, 115774, 1155522, 115778, 1155462, 1155472 va 115553) va 2-test sinovida foydalanilgan test topshiriqlarining 15 tasining (3-jadvalning 2-test sinovi qismida ajratib ko'rsatilgan ID raqamlari - 114169, 107304, 113873, 113869, 114126, 114190, 107341,

11447434, 107316, 112586, 1140992, 1074062, 1140912, 1141072 va 114107) hamda 3-test sinovida foydalanilgan test topshiriqlarining 7 tasining (3-jadvalning 3-test sinovi qismida ajratib ko'rsatilgan ID raqamlari - 107331, 107314, 107250, 112560, 107409, 10740934 va 1073972) umumiyl ball bilan korrelyatsiya koeffitsiyenti qiymati 0,25 dan kichikligi aniqlandi. 3-jadvaldan aksariyat test topshiriqlarining qiyinlik darajasi yuqori yoki past ekanligini ko'rish mumkin.

1-test sinovidagi ID raqamlari - 115784, 115769, 115779, 115760 bo'lgan test topshiriqlarinig qiyinlik darajasi taqsimotida o'rta ga yaqinligidan uning umumiyl ball bilan korrelyatsiyasi ancha kichikligini hisobga olish lozim.

3-jadval

Individual test topshiriqlariga berilgan javoblarining umumiyl ball bilan korrelyatsiyalari

№	1-test sivoni		2-test sivoni		3-test sivoni	
	ID	UBBKK	ID	UBBKK	ID	UBBKK
1.	115548	0,087	114169	0,225	1073812	0,311
2.	115765	0,457	107211	0,352	107318	0,295
3.	115555	0,331	107304	0,235	113866	0,334
4.	115781	0,456	113873	0,242	107286	0,385
5.	115755	0,444	107322	0,432	112568	0,313
6.	115770	0,285	112546	0,356	107331	0,233
7.	115763	0,407	112612	0,358	114196	0,447
8.	115762	0,436	107344	0,290	112607	0,349

9.	115767	0,500	112539	0,359	114179	0,363
10.	115771	0,352	113869	0,190	112612	0,496
11.	115782	0,369	107235	0,314	107333	0,426
12.	115776	0,246	113832	0,265	107381	0,516
13.	115768	0,433	107406	0,508	107235	0,498
14.	1155552	0,408	104179	0,458	107212	0,444
15.	115775	0,384	11447433	0,413	114115	0,416
16.	115783	0,318	114099	0,322	114193	0,335
17.	115772	0,353	114126	0,210	114191	0,447
18.	115754	0,431	107391	0,398	113848	0,440
19.	115759	0,390	107331	0,309	112616	0,279
20.	115780	0,317	104183	0,412	112592	0,402
21.	115756	0,298	112562	0,314	107190	0,439
22.	115758	0,144	113847	0,265	107230	0,395
23.	115777	0,422	114474	0,457	113851	0,343
24.	115550	0,404	113861	0,471	114125	0,390
25.	115786	0,373	114116	0,322	107339	0,413
26.	11575435	0,433	112580	0,265	107206	0,299
27.	115773	0,341	104190	0,287	107246	0,250
28.	115764	0,363	112592	0,434	112547	0,284
29.	115761	0,429	107292	0,528	107270	0,335
30.	115757	0,293	107204	0,323	1141252	0,295
31.	115785	0,343	107230	0,336	1141712	0,452
32.	1155502	0,522	114091	0,423	1141152	0,407
33.	115784	0,223	1073912	0,434	114132	0,427
34.	115769	0,203	112600	0,291	107376	0,475
35.	115779	0,148	1141162	0,433	107239	0,259
36.	115760	0,165	114190	0,192	1140832	0,334
37.	115766	0,313	113952	0,444	113949	0,334
38.	115546	0,278	114110	0,414	10740935	0,289
39.	115551	0,351	107341	0,194	114171	0,404
40.	11575434	0,181	114122	0,391	113957	0,320
41.	115547	0,351	1141222	0,429	1073762	0,440

42.	115554	0,398	1141102	0,295	107314	0,230
43.	115774	0,100	11447434	0,060	107402	0,541
44.	1155482	0,325	1141262	0,344	107250	0,237
45.	1155522	0,181	107311	0,330	1073672	0,351
46.	115778	0,096	113955	0,319	112560	0,073
47.	115552	0,327	107316	0,204	111033	0,376
48.	1155492	0,317	112586	0,229	107397	0,444
49.	1155542	0,356	114097	0,387	114083	0,357
50.	115549	0,287	1140992	0,182	107367	0,427
51.	1155512	0,293	1140972	0,338	1074022	0,442
52.	1155462	0,221	1074062	0,220	1141322	0,251
53.	1155472	0,230	1140912	0,192	107409	0,157
54.	1155532	0,284	1141072	0,143	10740934	0,118
55.	115553	0,225	114107	0,156	1073972	0,185

III. Test sinovlari natijalarining Rash modeli asosida tahlili

Klassik test nazariyasining ham, zamonaviy test nazariyasining ham asosiy maqsadi test va so'rovnomalar yordamida olingan natijalarni tahlil qilib, shaxslarning yashirin xususiyati (latent trait) bo'yicha ma'lum bir shkaladagi o'rnnini aniqlashdir [20]. Mazkur maqolada ham zamonaviy test nazariyasining modellaridan biri bo'lgan Rash modeli asosida tahlil natijalarini keltiramiz.

Test topshiriqlarini sifatini Rash modeli asosida matematik-statistik tadqiqoti hozirda keng tarqalgan usullardan biri bo'lib, u dunyoning qator yetakchi mamlakatlari ta'lim tizimida samarali foydalanib kelinmoqda.

Rash modeli turli xildagi so'rovnama va testlar yordamida

obyektiv o'lchashlarni amalga oshirish tomon qilingan harakatlar tufayli Daniyalik olim Jorj Rash tomonidan yaratilgan. Bir o'lchovlilikni ta'minlash mushkul bo'lishiga qaramasdan, uni ta'minlash uchun oldindan tayyor-garlik ishlarininini amalga oshirish va bu ishlar qanchalik amalga oshirilganini empirik usullar bilan tekshirish imkonи mavjud. Chiziqli mavhum shkalaga esa Rash modelida logit birliklari orqali o'tiladi. Rash modelining muhim xususiyati u shunchaki ma'lumotlarni tahlil qilish uchun statistik usul emas, balki u o'lchovni nimaligini, ta'lim tizimida o'lchovlarni qanday sifatili amalga oshirish imkoniyatini beradi [8].

Rash modelida [3-4] yashirin qobiliyat va elementlar qiyinligi kabi

parametrlarini aniqlash muhim o'rincutadi. Bu ikkita kattalikdan birinchisi o'zgaruvchi sifatida, ikkinchisi esa parametr sifatida qaralishi mumkin. Test natijalarini tahlil qilishda elementlar qiyinlik darajasini parametr sifatida qarash qulay, chunki qobiliyat (bilim) bu modelda elementlarga berilgan javoblarga qarab belgilanadi.

Rash modeliga ko'ra, dixotomik elementlarga individual javoblar shaxsning qobiliyat darajasi va element qiyinligi bilan aniqlanadi. Ma'lum bir qobiliyatga ega bo'lgan shaxsning ma'lum bir qiyinlikdagi elementga to'g'ri javob berish ehtimolligini aniqlaydi. Bu quyidagi matematik formula orqali ifodalanadi:

$$P(X_{is} = 1 | \theta_s, b_i) = \frac{e^{\theta_s - b_i}}{1 + e^{\theta_s - b_i}}$$

Bu yerda, X_{is} – s- talabgorning i - elementga to'g'ri javob berish ehtimolligi, θ_s – qobiliyat o'zgaruvchisi, b_i – topshiriq qiyinlik darajasi, e – natural logarifm asosi ($e=2,7182818\dots$).

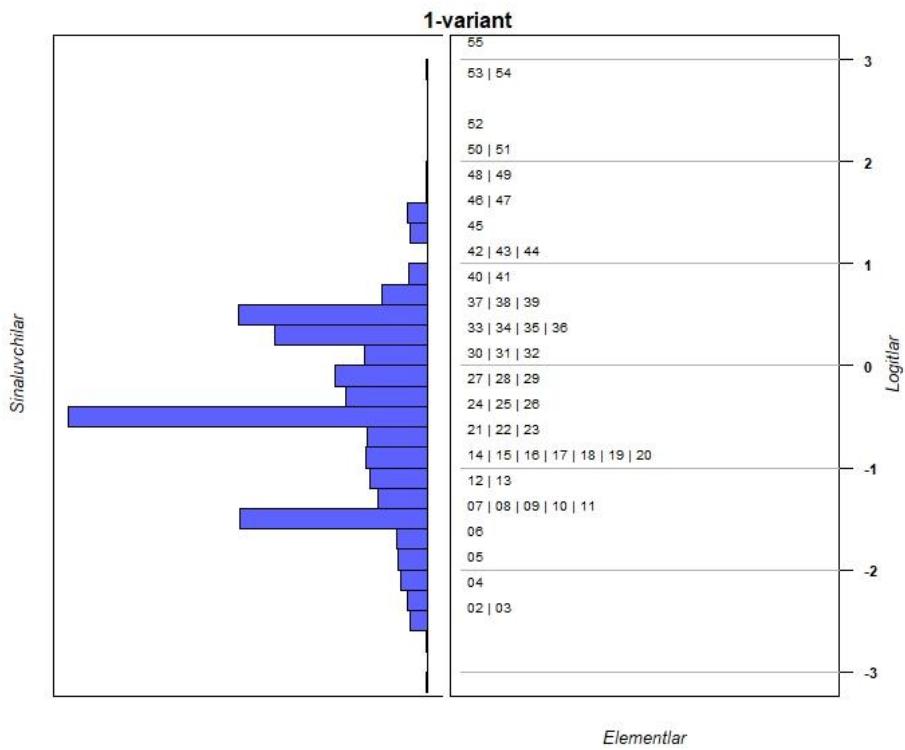
Geografiya fanidan test sinovlari natijalarining Rash modeli bo'yicha tahlilini maxsus dastur asosida amalgao shirish uchun ishlab chiqilgan turli xil dasturiy paketlardan foydalanamiz. Masalan, qiyinlik darajasi b ni aniqlashda biz dexter dasturiy paketidan foydalanamiz [5], chunki Rash modeli uchun bu dasturiy paket yordamida tajribaning (test natijalari)

modelga qanchalik mosligini hisoblash mumkin bo'ladi.

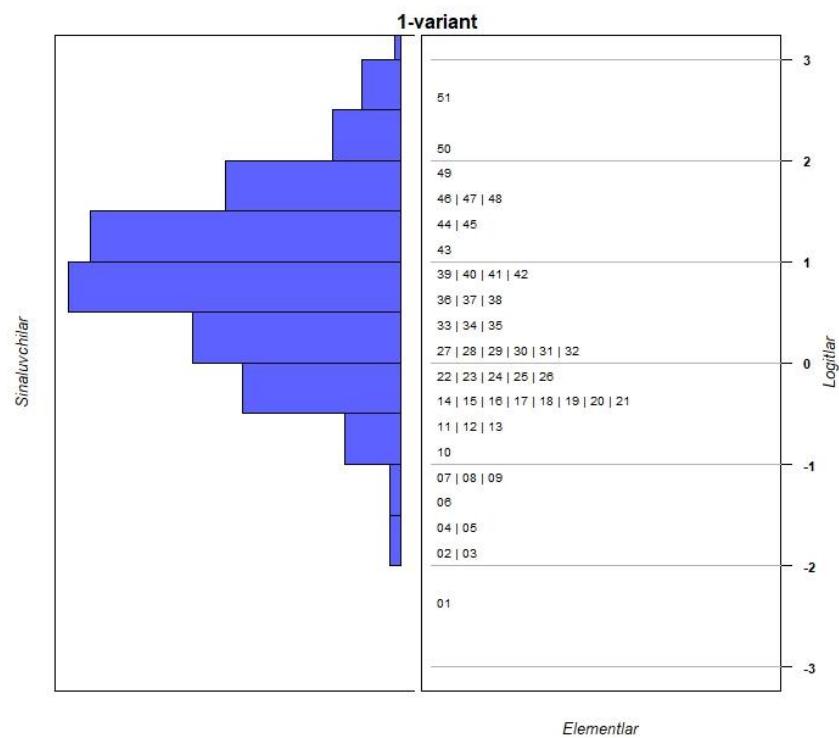
Rash modeli asosida aniqlangan qiyinlik darajalarini talabgorlar qobiliyatlariga qanchalik mosligini Rayt xaritasi yordamida tahlil qilish mumkin.

Rayt xaritasi – test topshiriqlarining qiyinlik darajalari va talabgorlarning qobiliyat darajalari o'zaro mos kelishini aniqlovchi diagrammadir [21]. Rayt xaritasining chizmasini olishda [22] dasturiy paketidan foydalanildi. 2-, 3- va 4-rasmlarda mos ravishda geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-, 2- va 3-test sinovi natijalari asosida chizilgan Rayt xaritalari keltirilgan. 2-rasmdan qobiliyat darajalari **-3,05** va **2,83** logit birligi orasida, test topshiriqlari qiyinlik darajalari esa (**-3,95: 3,36**) oraliqda va 3-rasmdan qobiliyat darajalari **-1,62** va **3,58** logit birligi orasida, test topshiriqlari qiyinlik darajalari esa (**-2,39: 4,97**) oraliqda hamda 4-rasmdan qobiliyat darajalari **-4,34** va **4,16** logit birligi orasida, test topshiriqlari qiyinlik darajalari esa (**-1,93: 3,63**) oraliqda taqsimlanganligi kuzatildi.

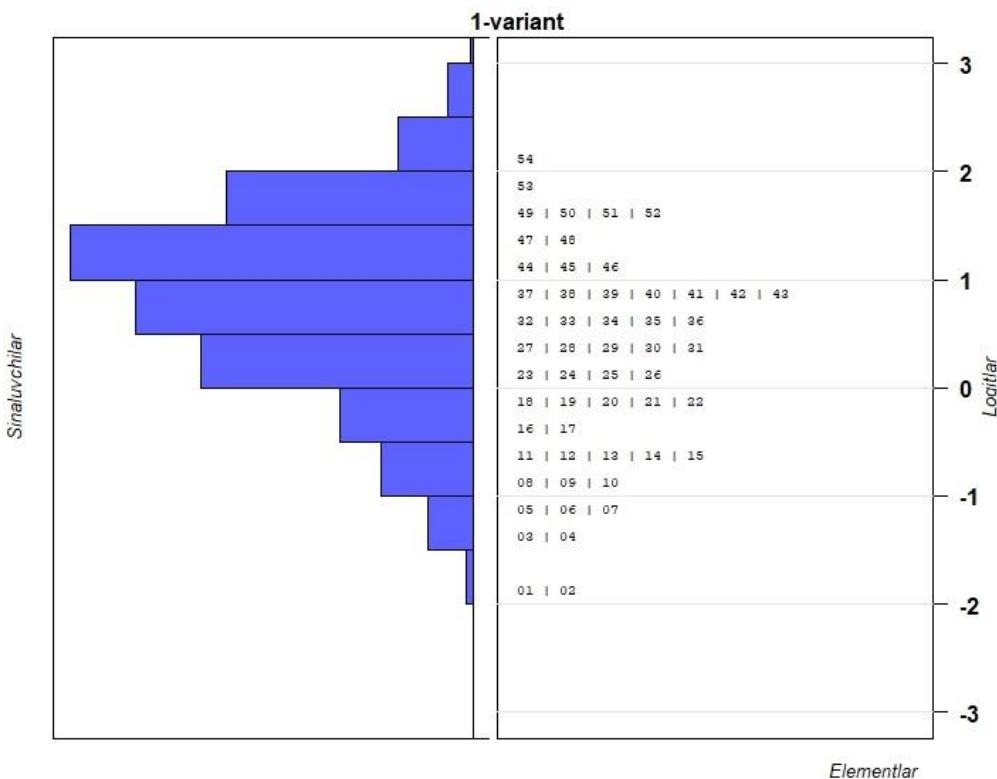
Qiyinlik darajasi bo'yicha 2-rasmdagi 55-o'rinda turgan, 3-rasmdagi 52-55-o'rindarda turgan va 4-rasmdagi 55-o'rinda turgan test topshirilari - test topshiriqlarining qiyinlik darajalari bo'yicha 3 logit birligidan tashqarida ekanligi ko'rini turibdi.



2-rasm. 1-test sinovi natijalari asosida aniqlangan qobiliyat va qiyinlik darajalarining mosligi



3-rasm. 2-test sinovi natijalari asosida aniqlangan qobiliyat va qiyinlik darajalarining mosligi



4-rasm. 3-test sinovi natijalari asosida aniqlangan qobiliyat va qiyinlik darajalarining mosligi

Demak, -3 logit birligidan kichik va 3 logit birligidan katta qiyinlik darajasiga ega bo'lgan test topshiriqlari, mos ravishda, juda oson yoki juda qiyin test topshiriqlaridir.

Qiyinlik darjasini bo'yicha (-3:3) logit birligi oralig'idan tashqarida joylashgan (yuqorida keltirilgan) test topshiriqlaridan kam miqdorda ma'lumot olinishi sababli bunday test topshiriqlarining o'rni (-3:3) logit birligi oralig'iga to'g'ri keladigan qiyinlikdagi test topshiriqlaridan qo'yish maqsadga muvofiq bo'ladi. Biroq bunday test topshiriqlari agarda talabgorlar orasida shu test topshiriqlariga mos qobiliyatli talabgorlar bo'lsa, shunday test

topshiriqlarining mavjudligi ular to'g'risida ma'lumot beradi. Aks holda qiyinlik darjasini juda past va juda yuqori bo'lgan test topshiriqlarining o'rni (-3:3) logit birligi atrofidagi test topshiriqlaridan kiritish, yuqori va past qobiliyat darajalaridan olinadigan ma'lumot miqdori orasidagi tafovutni yanada kamaytirish imkonini beradi.

2-rasmdan 1-test sinovi uchun tanlab olingan variantda test topshiriqlari talabgorlarning qobiliyatlariga mos ekanligi ko'rindi.

3-rasmdan qiyinlik darajalari bo'yicha 52-55-o'rnlarda turgan test topshiriqlari 3 logit birligidan tashqarida bo'lsa-da, ushbu test topshiriqlarini yecha oladigan

qobiliyatli talabgorlar ham mavjud ekanligi ko'rinadi.

4-rasmda esa bunday test topshiriqlari 1 dona bo'lib, bu qiyinlik darajasi bo'yicha 55-o'rinda turgan test topshirig'idir. Bunda ham ushbu topshiriqni yecha oladigan yuqori qobiliyatli talabgorlarning mavjudligini ko'rish mumkin.

Quyida test topshiriqlarining Rash modeli bilan aniqlangan qiyinlik darajalarini ko'rib chiqamiz. 4-jadvalda geografiya fanidan milliy sertifikat uchun o'tkazilgan test sinovi natijalarining Rash modeli bilan aniqlangan qiyinlik darajalari keltilrilgan.

4-jadvaldagi 1-test sinovi natijalari bo'yicha aniqlangan qiyinlik

darajalariga e'tibor bersak, 115553 ID raqamli test topshirig'i eng qiyin, 115548 ID raqamli test topshirig'i esa eng oson ekanligi, 2-test sinovi natijalari bo'yicha aniqlangan qiyinlik darajalarini ko'radigan bo'lsak, 114107 ID raqamli test topshirig'i eng qiyin, 114169 ID raqamli test topshirig'i esa eng oson ekanligi va 3-test sinovi natijalari bo'yicha aniqlangan qiyinlik darajalarini ko'radigan bo'lsak, 1073972 ID raqamli test topshirig'i eng qiyin, 1073812 ID raqamli test topshirig'i esa eng oson ekanligi ko'rinadi. Bu esa 2-, 3- va 4-rasm-lardagi Rayt xaritasida ham o'z aksini topgan.

4-jadval

Rash modeli bilan aniqlangan qiyinlik darajalari

Nº	1- test sinovi		2- test sinovi		3- test sinovi	
	ID	b	ID	b	ID	b
1.	115548	-3,96	114169	-2,39	1073812	-1,93
2.	115765	-2,41	107211	-1,82	107318	-1,83
3.	115555	-2,37	107304	-1,82	113866	-1,32
4.	115781	-2,03	107322	-1,74	107286	-1,31
5.	115755	-1,91	113873	-1,56	112568	-1,24
6.	115770	-1,71	112546	-1,34	114196	-1,04
7.	115763	-1,38	107344	-1,19	107331	-1,00
8.	115762	-1,37	112612	-1,15	112607	-0,91
9.	115767	-1,35	112539	-1,01	112612	-0,88
10.	115771	-1,30	113869	-0,94	114179	-0,81

11.	115782	-1,26	107235	-0,73	107235	-0,66
12.	115776	-1,24	113832	-0,68	107381	-0,59
13.	115768	-1,22	107406	-0,65	107333	-0,59
14.	1155552	-0,96	11447433	-0,49	107212	-0,57
15.	115775	-0,95	114099	-0,49	114115	-0,51
16.	115783	-0,94	114126	-0,47	114193	-0,32
17.	115772	-0,91	104179	-0,44	114191	-0,28
18.	115754	-0,78	107391	-0,39	113848	-0,25
19.	115759	-0,77	107331	-0,37	112616	-0,22
20.	115780	-0,76	104183	-0,30	112592	-0,18
21.	115756	-0,66	112562	-0,25	107190	-0,13
22.	115758	-0,66	114474	-0,23	107230	-0,05
23.	115777	-0,53	113847	-0,23	113851	0,06
24.	115550	-0,37	113861	-0,18	114125	0,06
25.	115786	-0,30	114116	-0,14	107339	0,07
26.	11575435	-0,30	112580	-0,05	107206	0,18
27.	115773	-0,21	104190	0,05	107246	0,34
28.	115764	-0,18	112592	0,05	112547	0,37
29.	115761	-0,05	107204	0,16	107270	0,48
30.	115757	0,06	107230	0,18	1141252	0,48
31.	115785	0,15	114091	0,22	1141712	0,49
32.	1155502	0,24	107292	0,22	1141152	0,56
33.	115784	0,25	1073912	0,31	114132	0,59
34.	115769	0,28	112600	0,33	107376	0,63
35.	115779	0,38	1141162	0,43	107239	0,69
36.	115760	0,44	114190	0,58	1140832	0,71
37.	115766	0,56	113952	0,64	113949	0,77
38.	115546	0,65	114110	0,65	10740935	0,80
39.	115551	0,71	107341	0,82	114171	0,82
40.	11575434	0,82	114122	0,86	113957	0,92
41.	115547	0,99	1141222	0,93	1073762	0,93

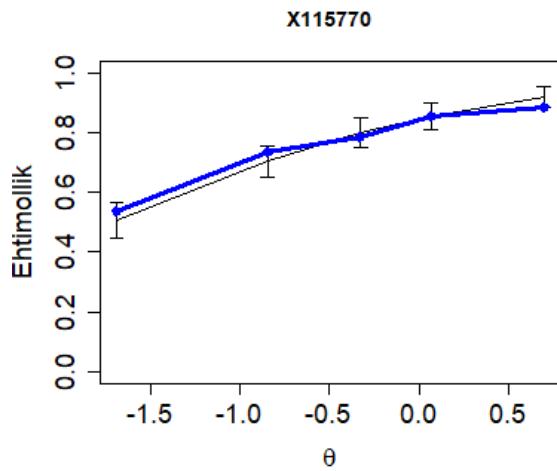
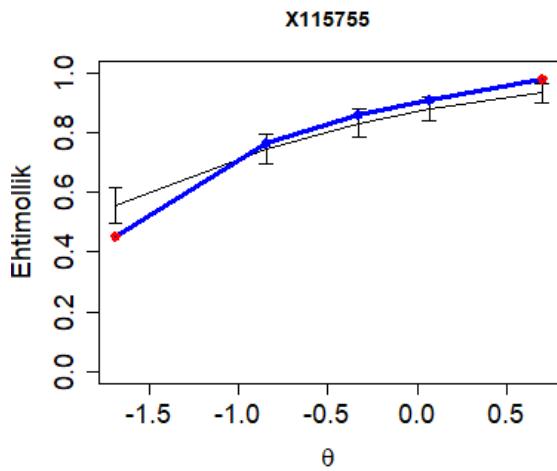
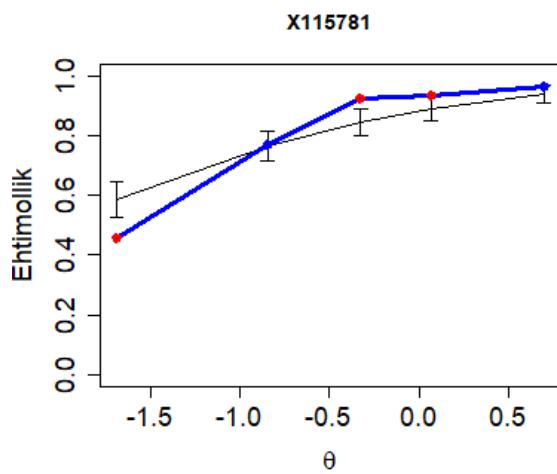
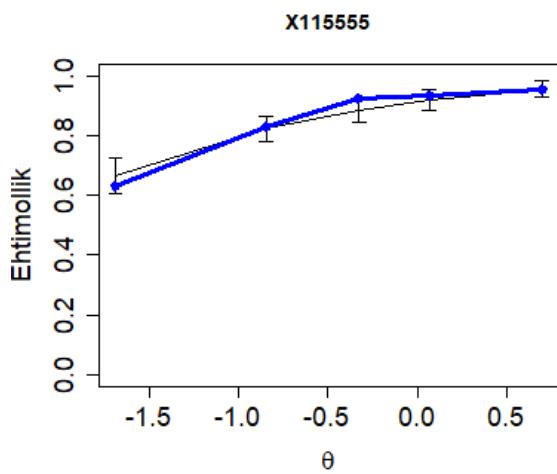
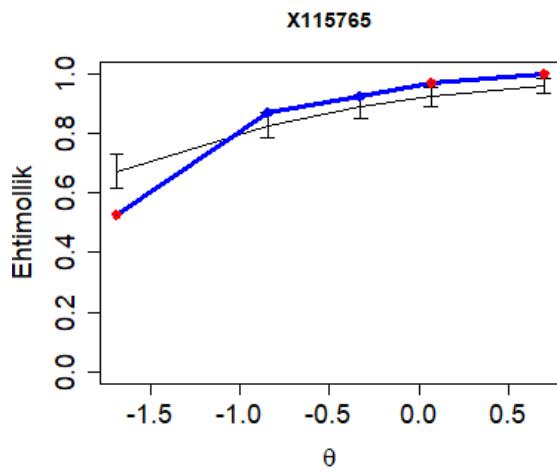
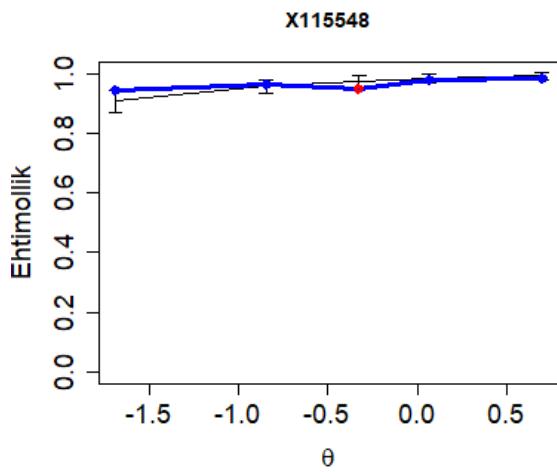
42.	115554	1,07	1141102	0,99	107402	0,98
43.	115774	1,08	11447434	1,10	107314	0,98
44.	1155482	1,16	1141262	1,28	107250	1,04
45.	1155522	1,38	107311	1,46	1073672	1,13
46.	115778	1,50	113955	1,54	112560	1,21
47.	115552	1,71	107316	1,64	111033	1,28
48.	1155492	1,81	112586	1,70	107397	1,41
49.	1155542	1,82	114097	1,83	114083	1,53
50.	115549	2,07	1140992	2,10	107367	1,54
51.	1155512	2,24	1140972	2,59	1074022	1,56
52.	1155462	2,41	1074062	3,23	1141322	1,58
53.	1155472	2,79	1140912	4,25	107409	1,98
54.	1155532	2,95	1141072	4,62	10740934	2,08
55.	115553	3,36	114107	4,97	1073972	3,69

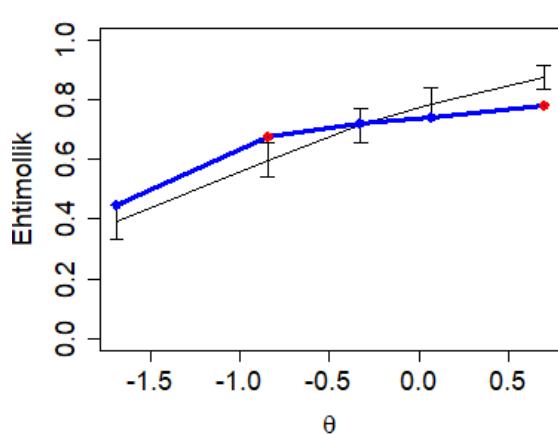
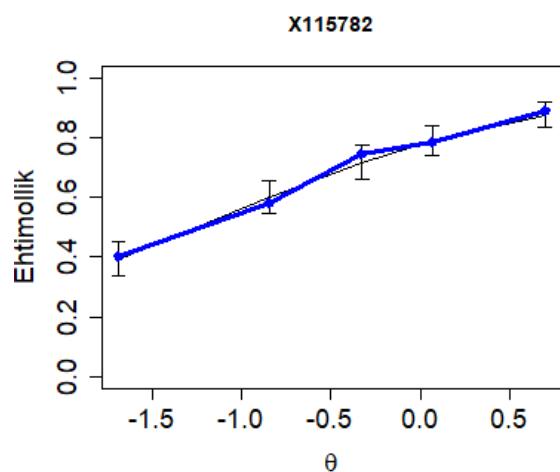
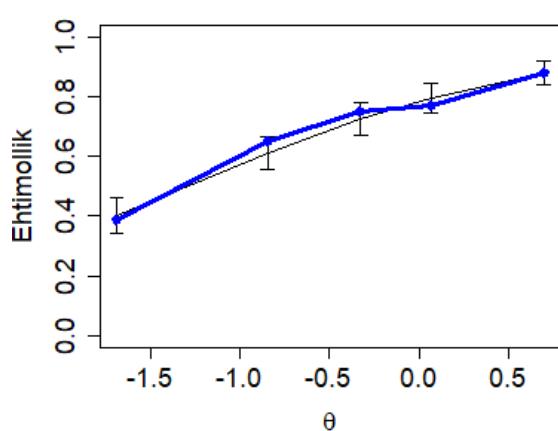
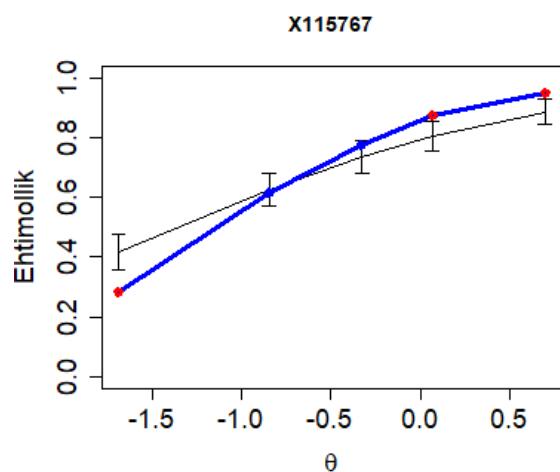
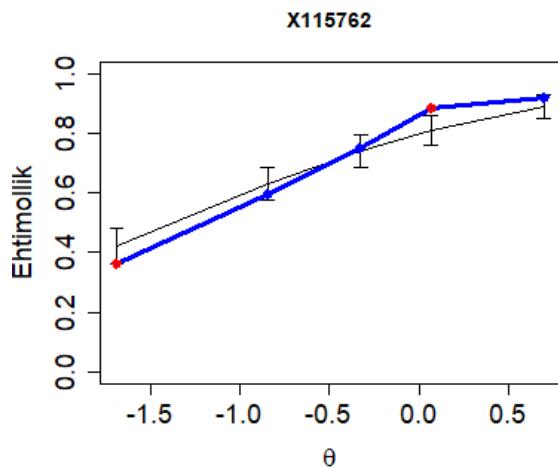
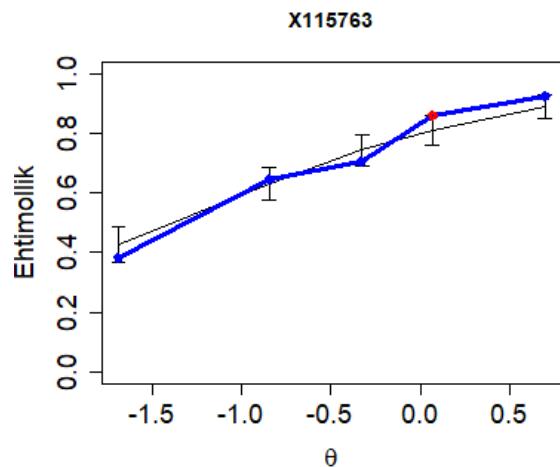
Test topshiriqlarining Rash modeli bilan mosligi ham muhim ahamiyatga kasb etadi. Har xil qobiliyat darajalarini aniqlash uchun kalibrovkalangan test topshiriqlari bazasini yaratishda test topshiriqlarining Rash modeli bilan moslik statistikalarini o'rganib chiqish kerak.

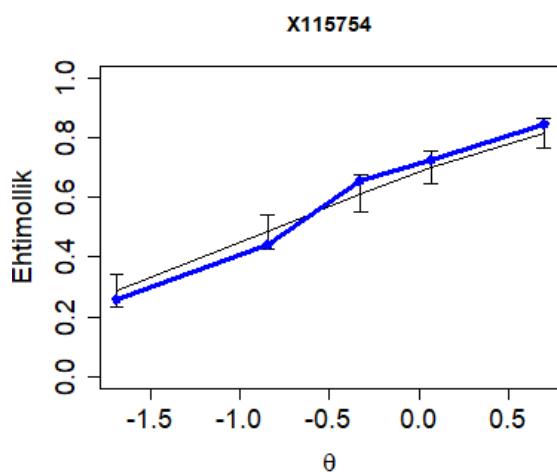
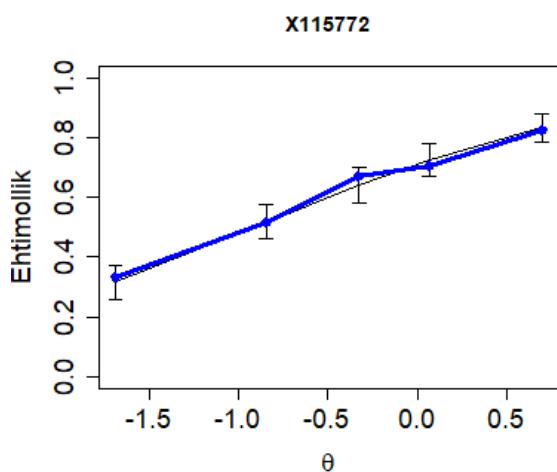
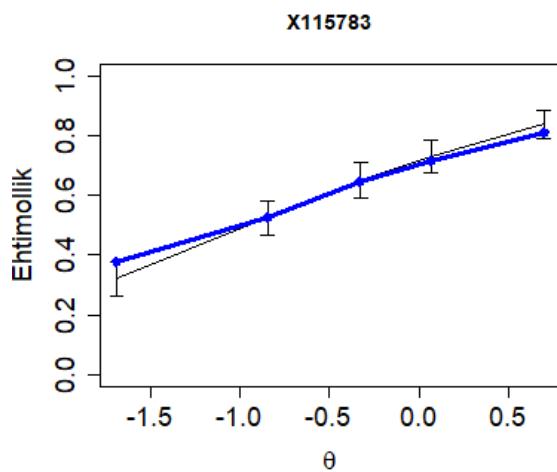
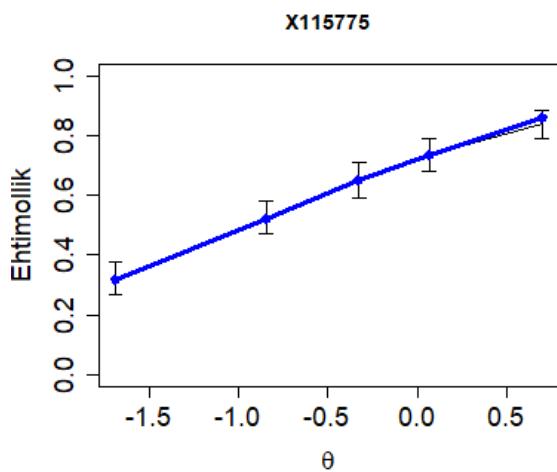
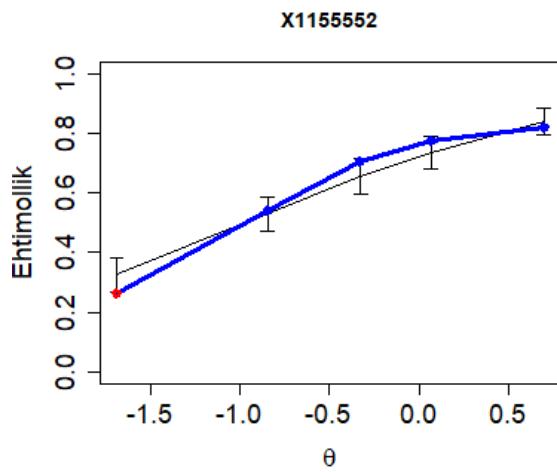
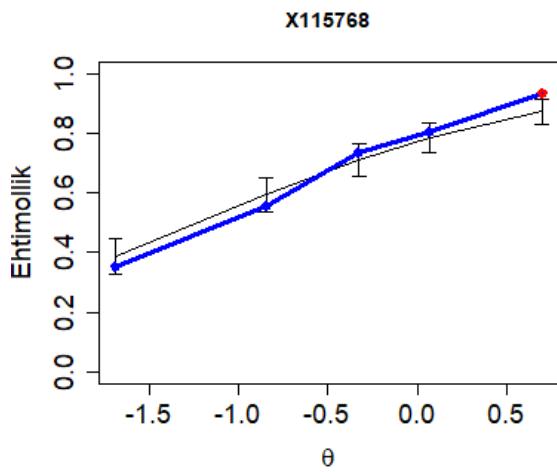
5a-, 5b- va 5c-rasmlarda mos ravishda geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-, 2- va 3-test sinovi natijalarining Rash modeli bilan mosligi - talabgorlar 5 ta qobiliyat guruhiiga bo'lingan va qalin ko'k chiziqlar bilan test sinovlaridan olingan natijalar, ingichka qora chiziq bilan kutiladigan qiymatlar esa vertikal

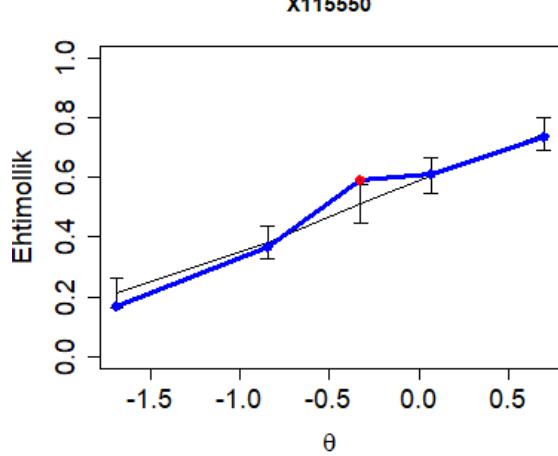
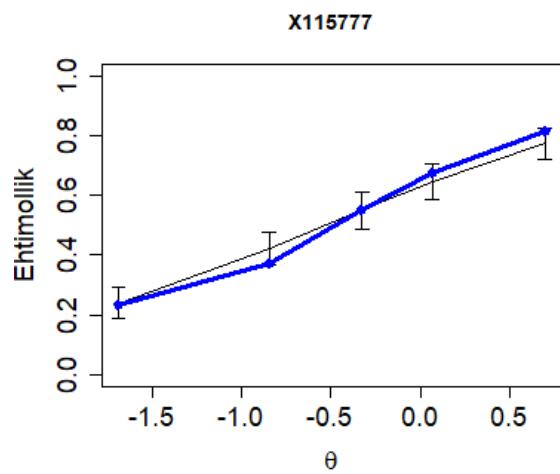
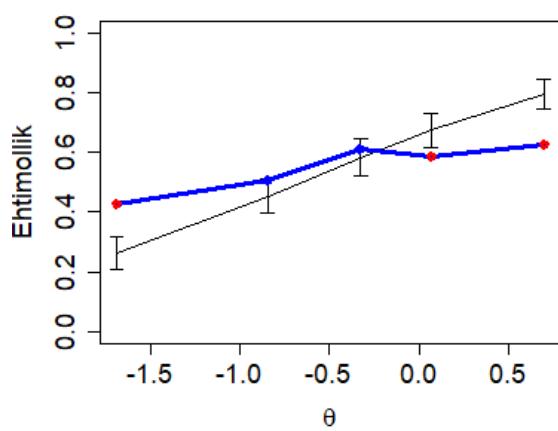
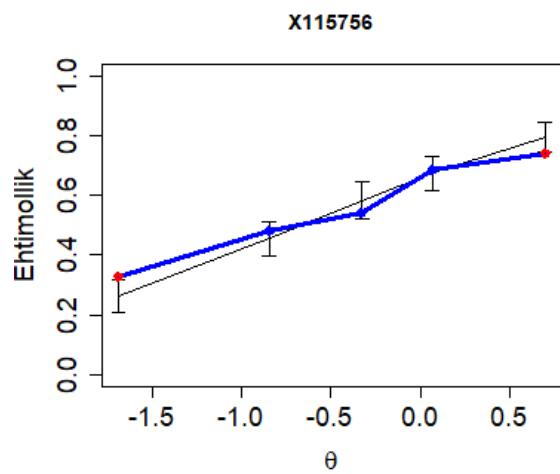
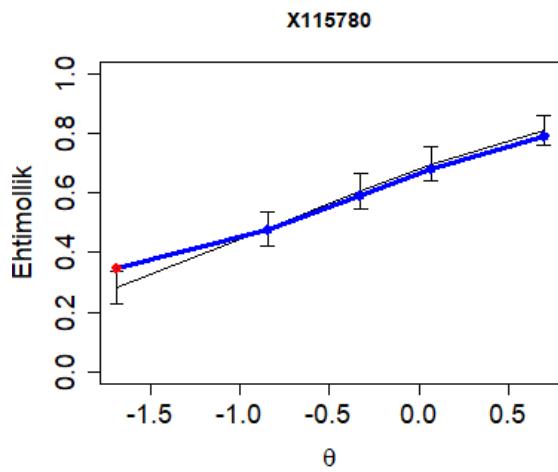
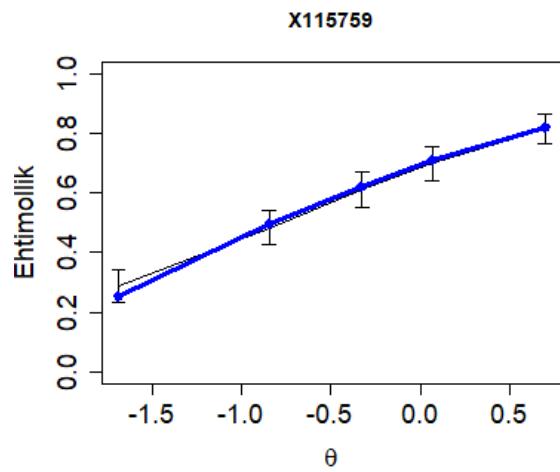
standart xatolik chiziqlari bilan birga ko'rsatilgan. Standart xatolik chegarasidan chiqib ketgan nuqtalar qizil doirachalar bilan belgilangan. Rasm-larning yuqorisidagi raqamlar test topshiriqlarining ID raqamini bildiradi.

Geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-test sinovi tahlili natijalariga ko'ra ID raqamlari - 101155, 101166, 101412 va 101590 bo'lgan test topshiriqlarining Rash modeli bilan moslik darjasini yaxshi emasligini ya'ni ajratilgan qobiliyat guruhlarining barchasi bilan mos tushmaganligini bildiradi (5a-rasm).

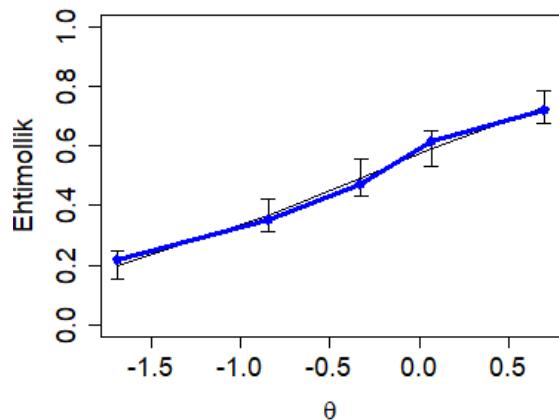




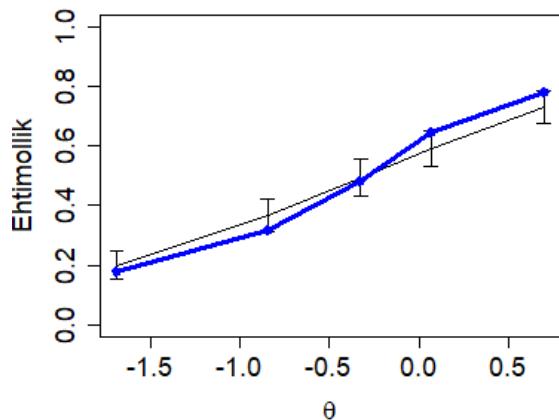




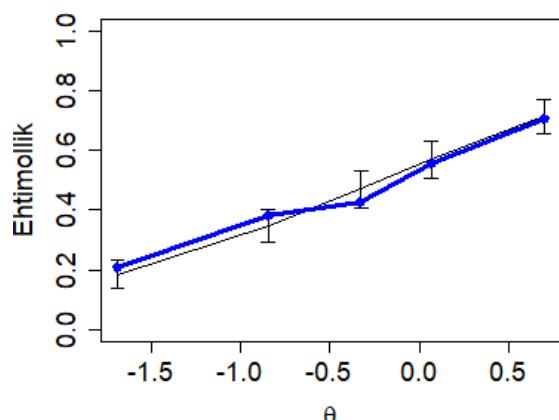
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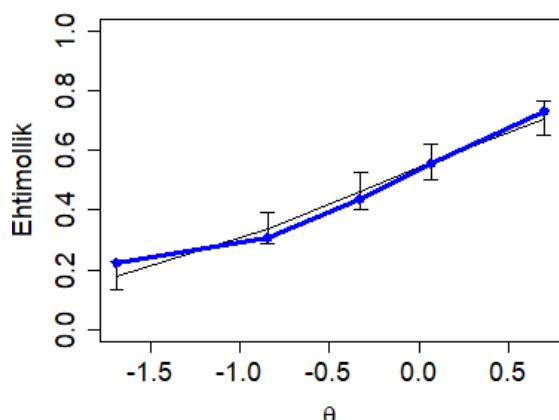
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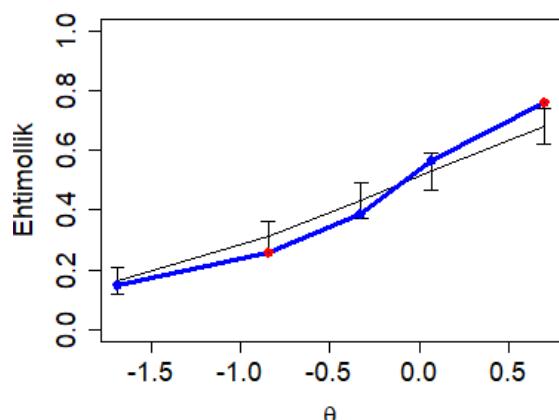
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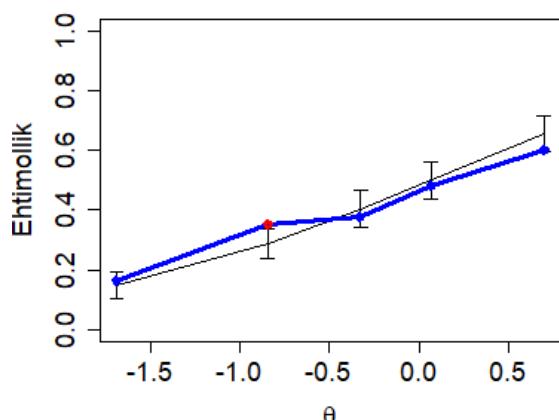
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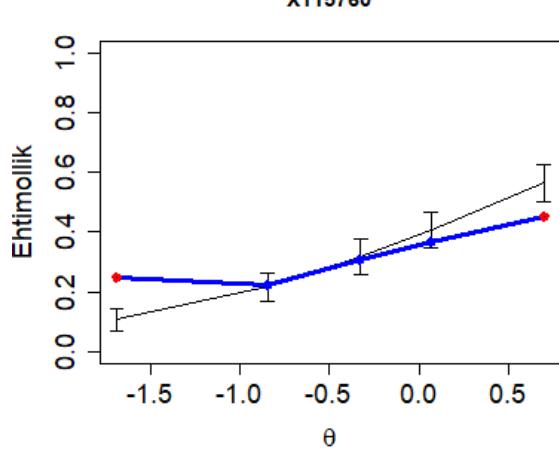
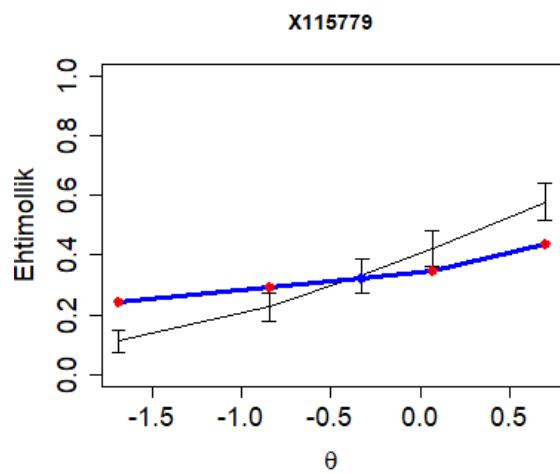
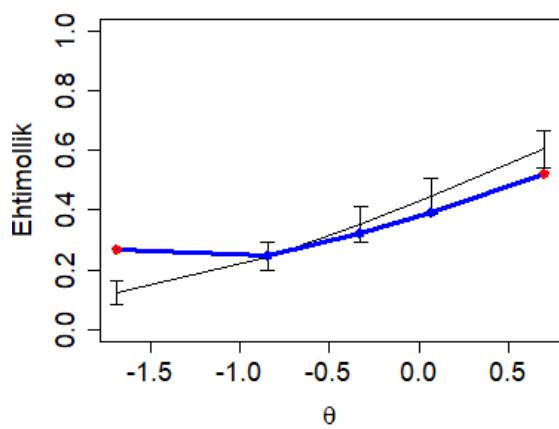
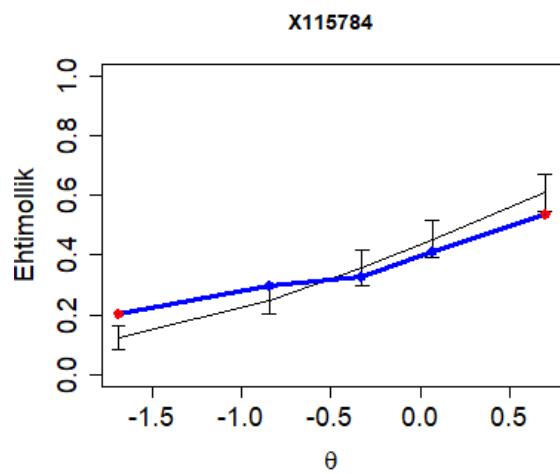
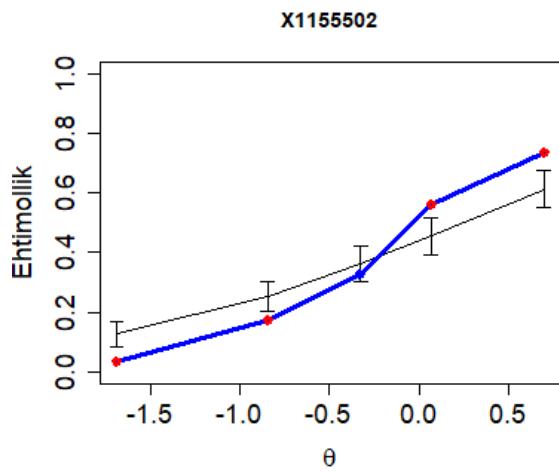
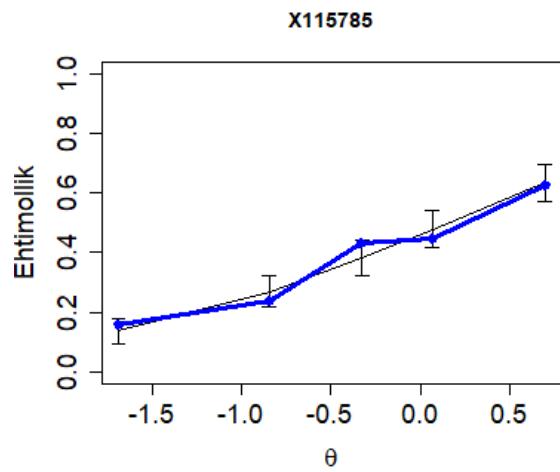


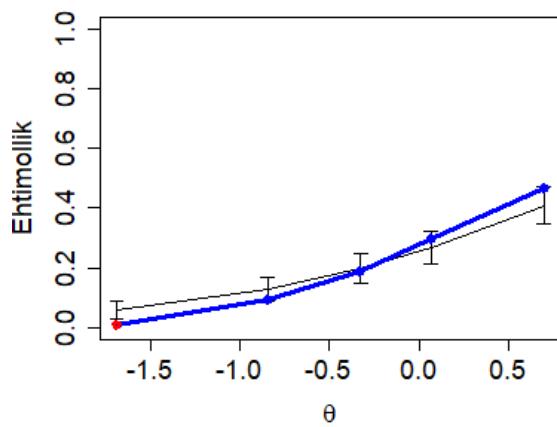
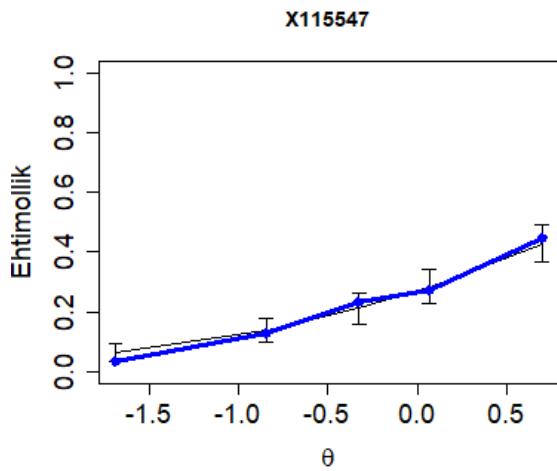
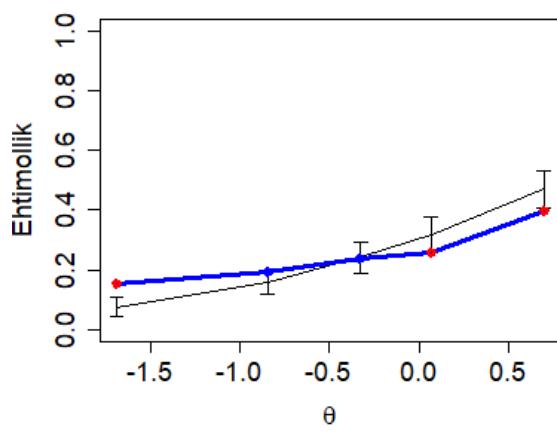
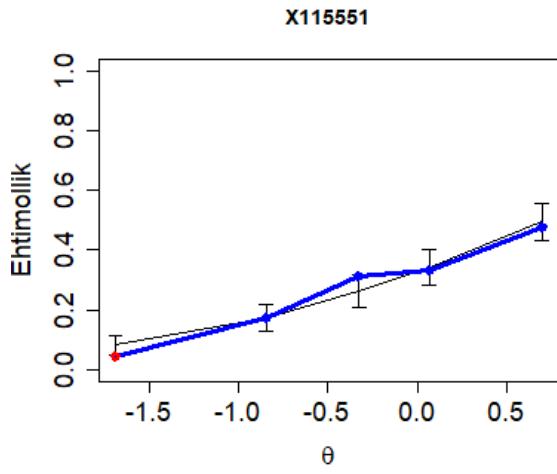
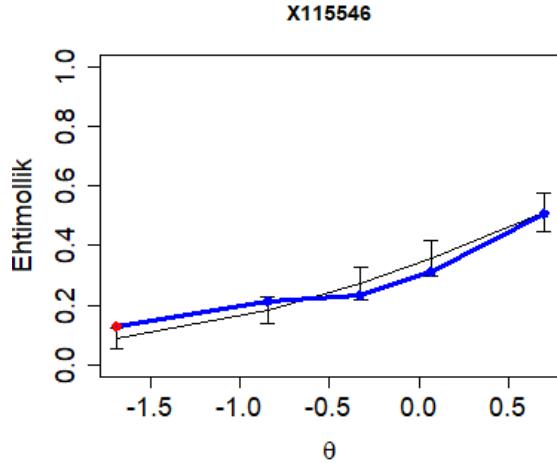
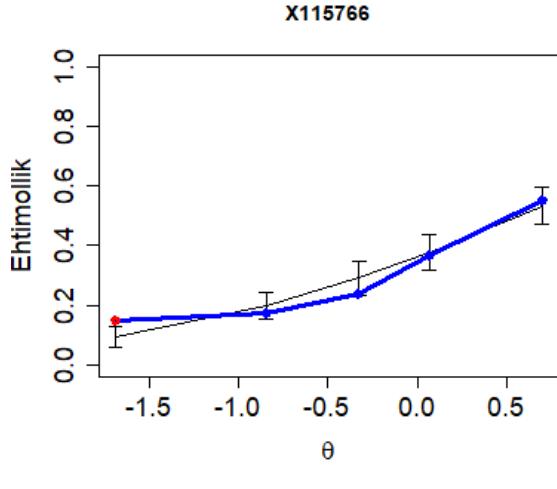
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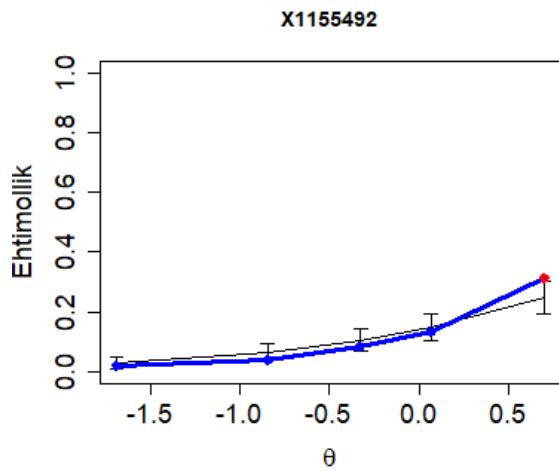
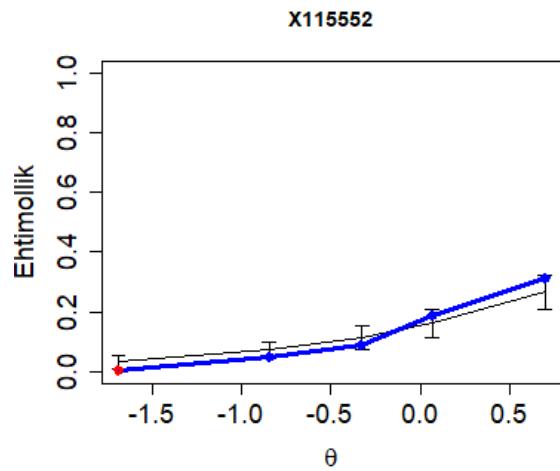
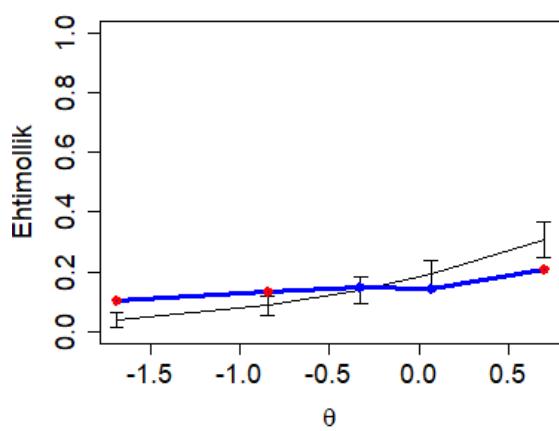
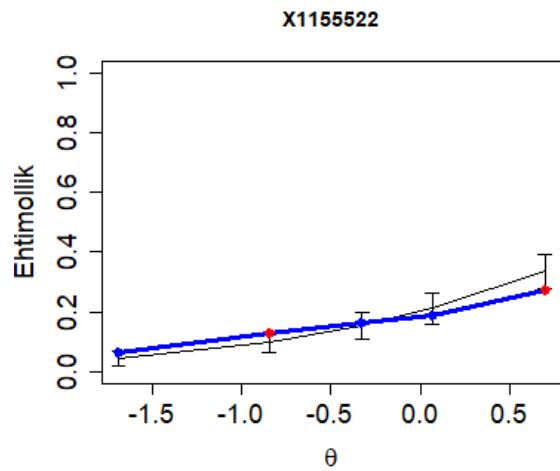
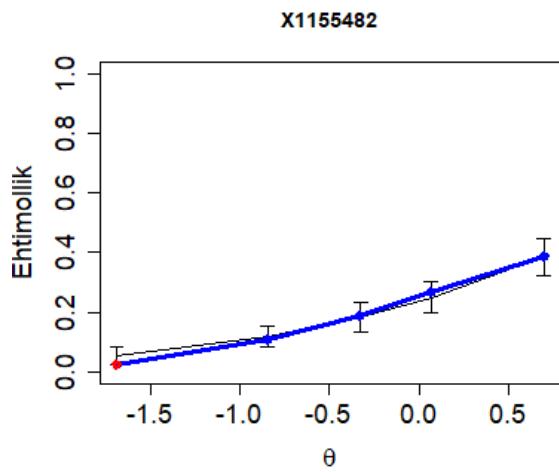
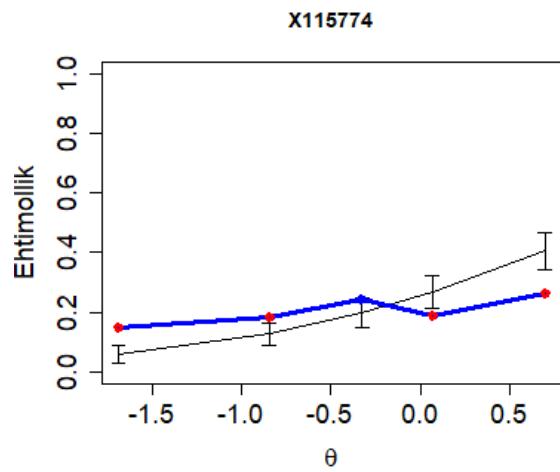


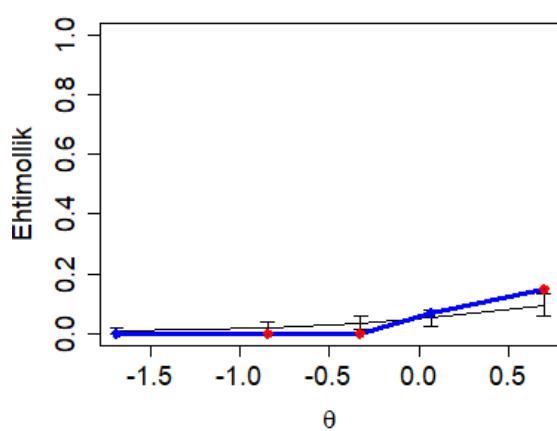
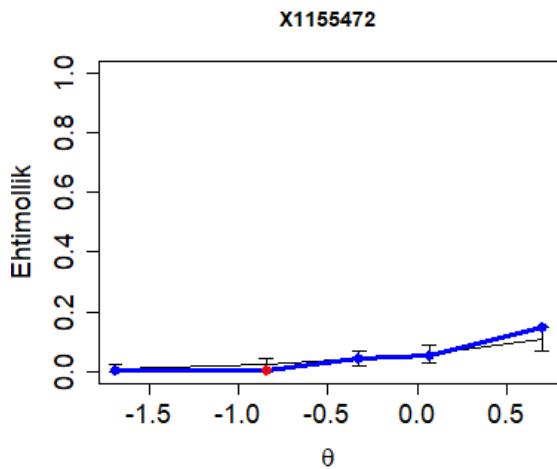
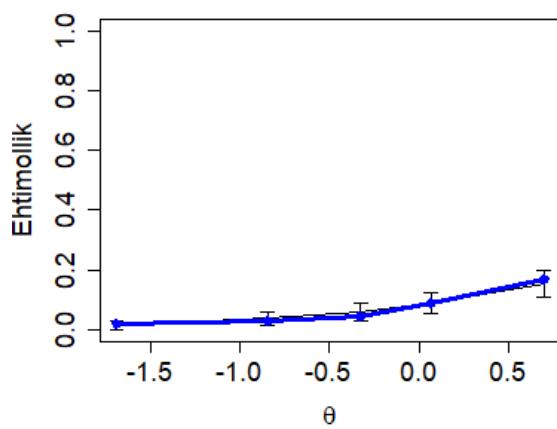
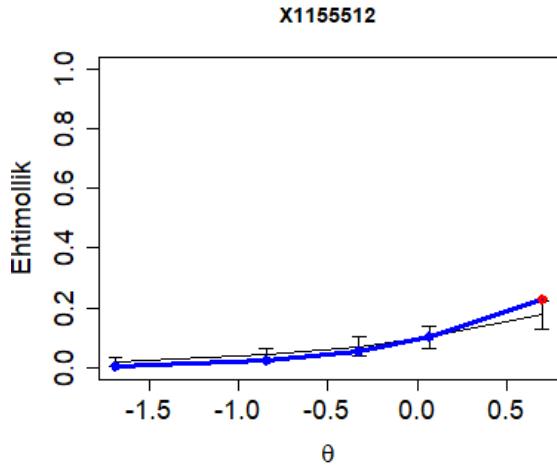
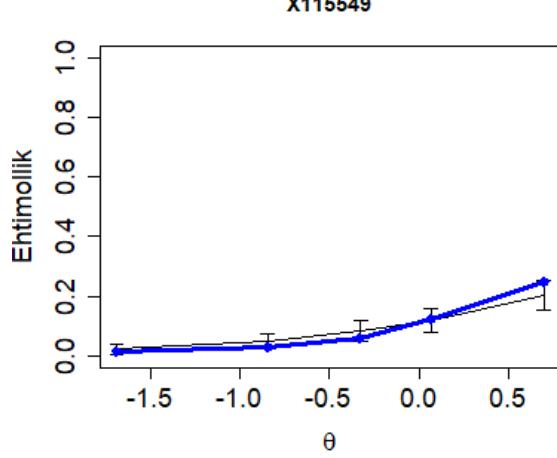
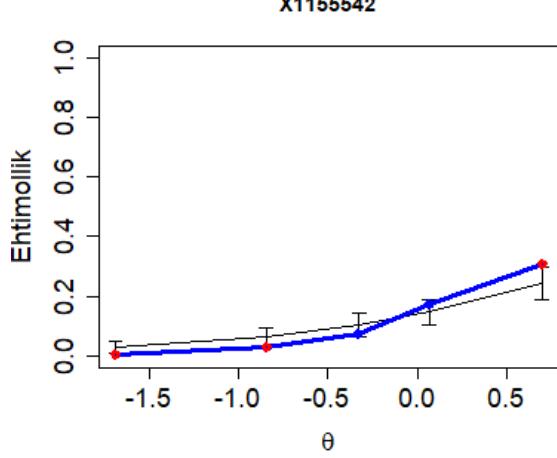
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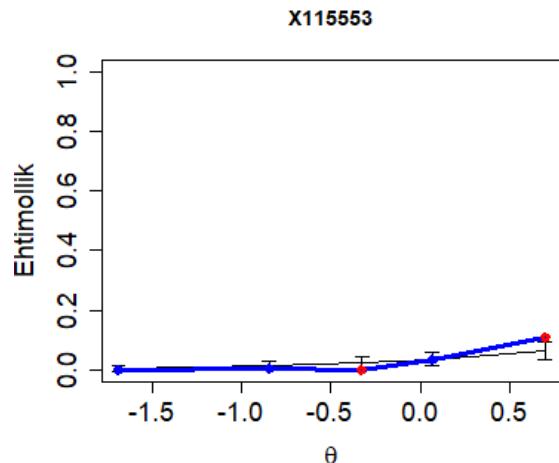








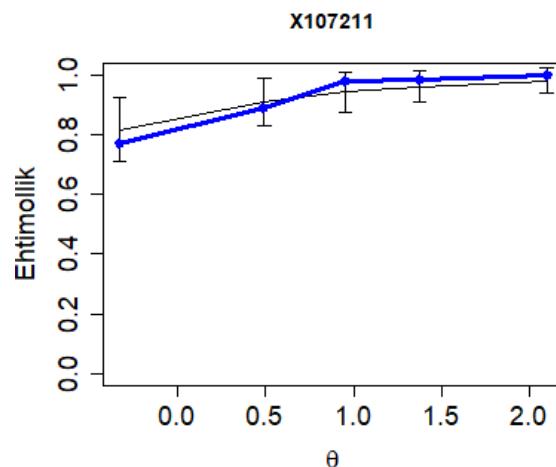
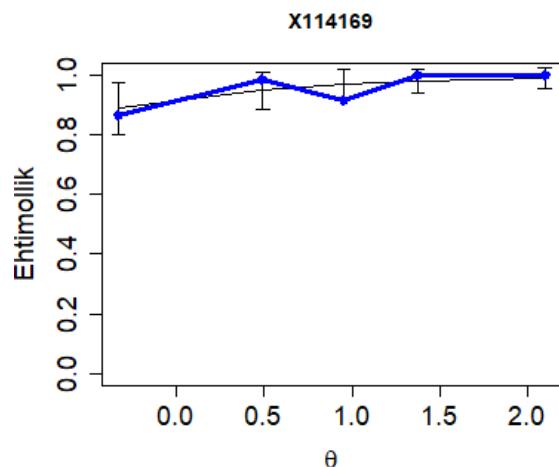


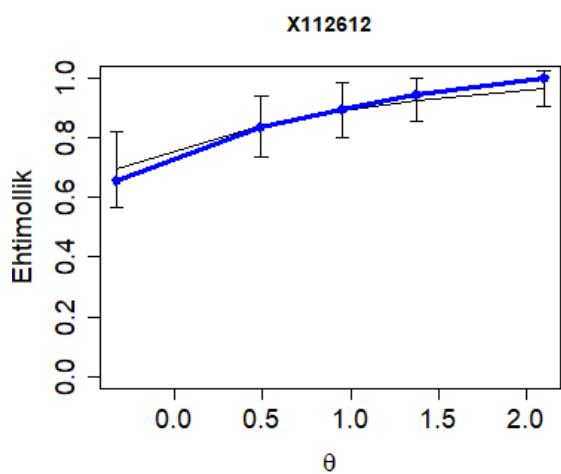
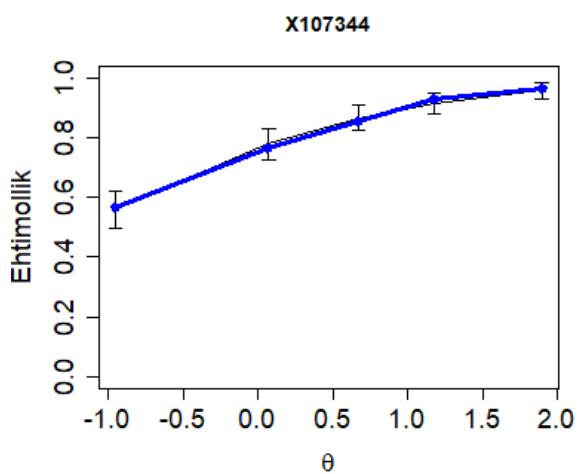
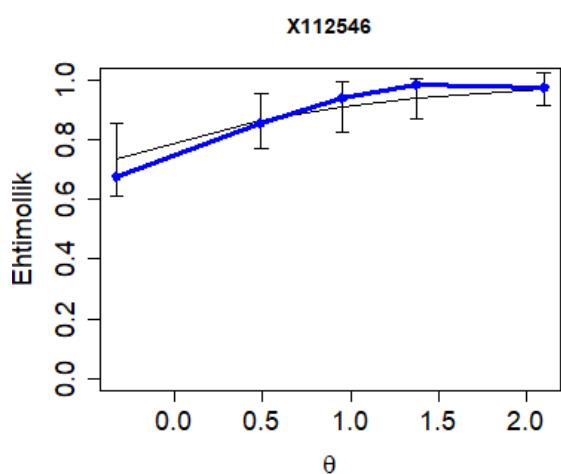
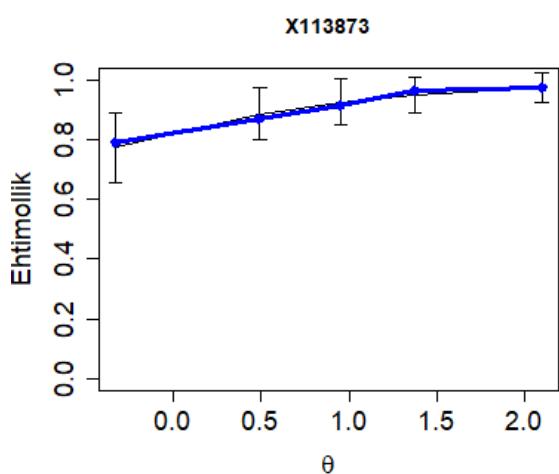
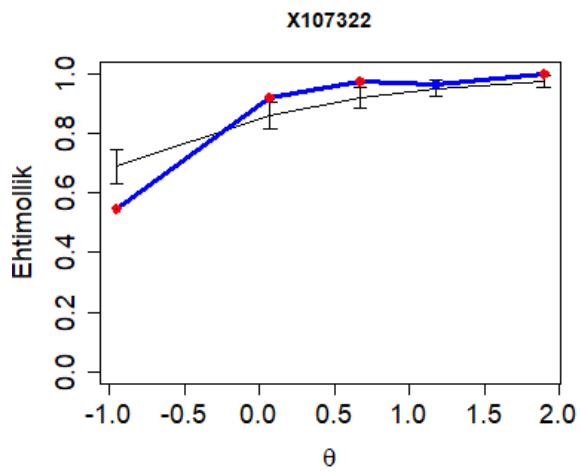
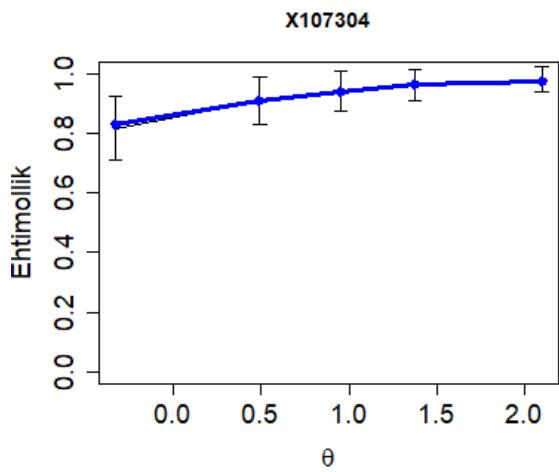


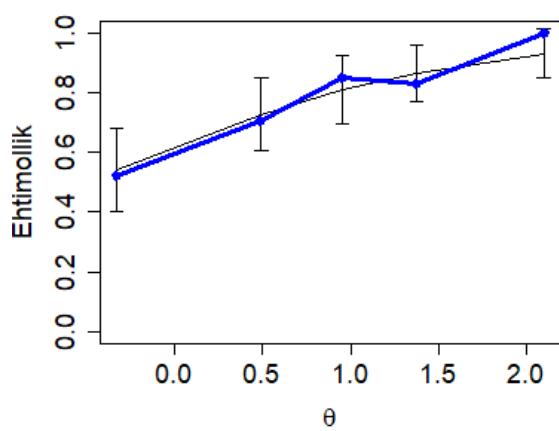
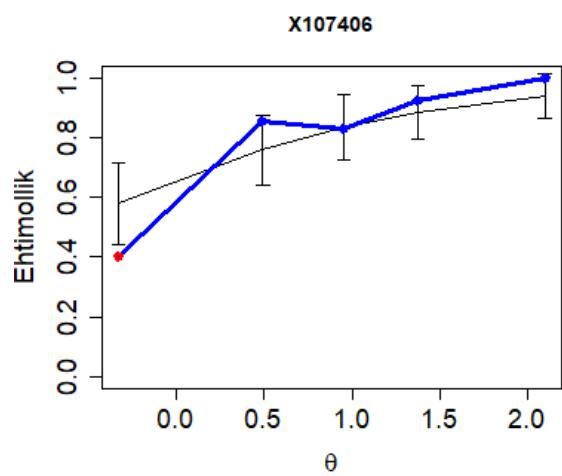
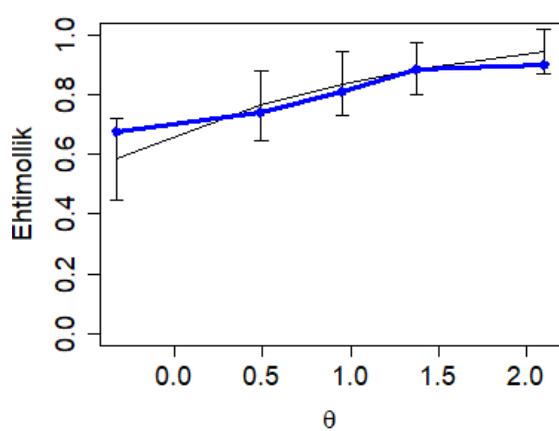
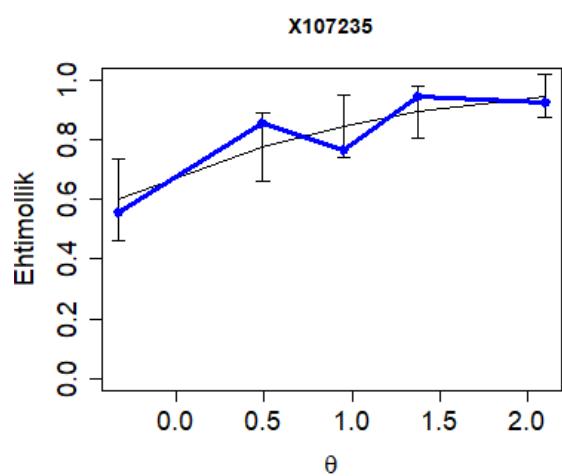
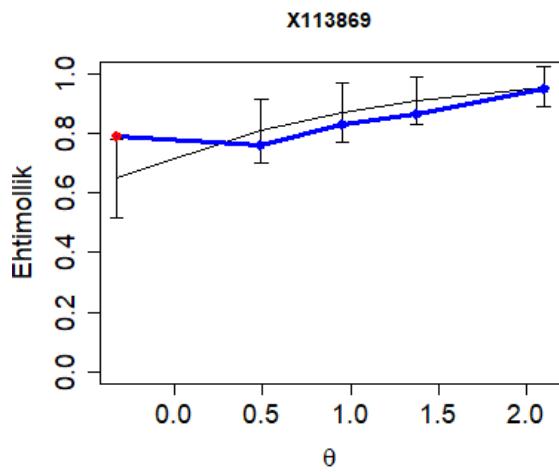
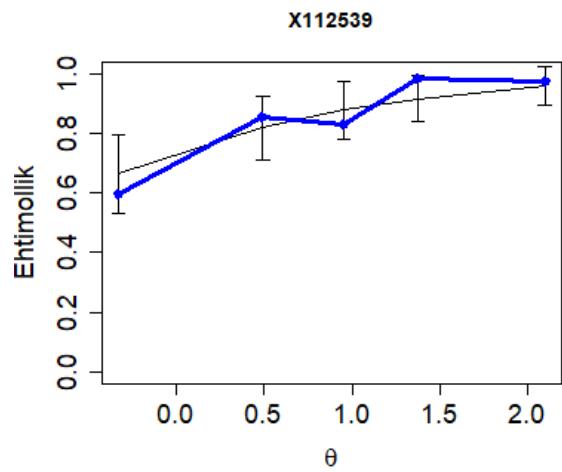
5a-rasm. Geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-test sinovi natijalarining Rash modeli bilan mosligi

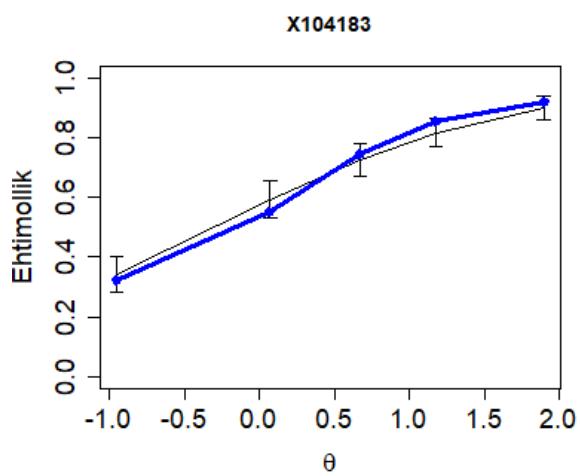
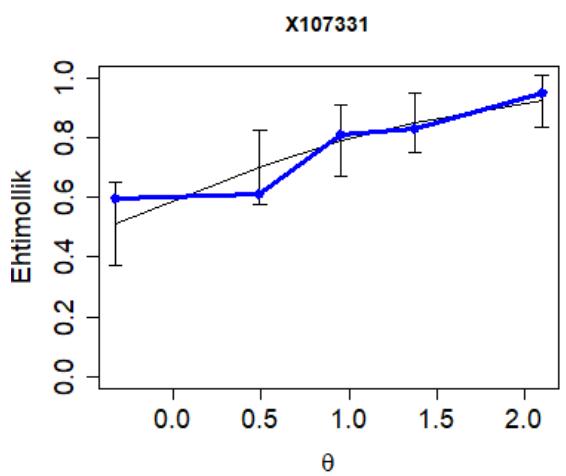
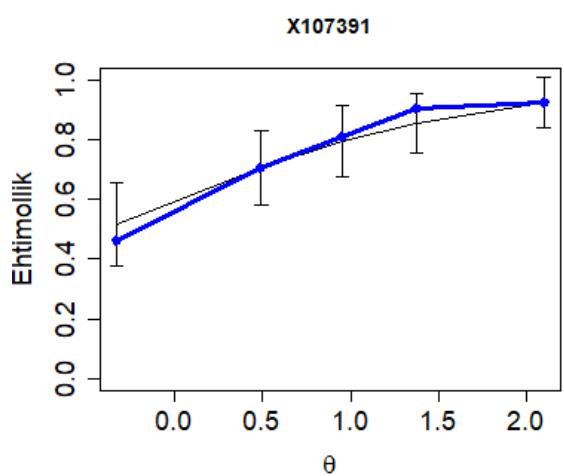
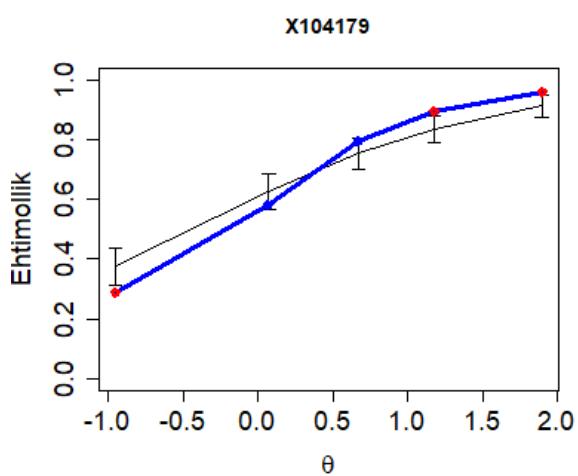
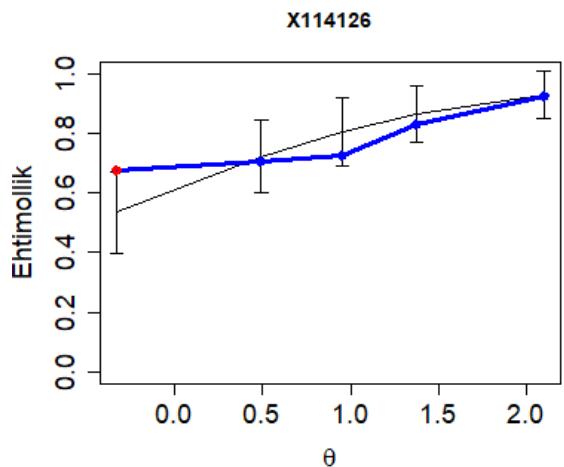
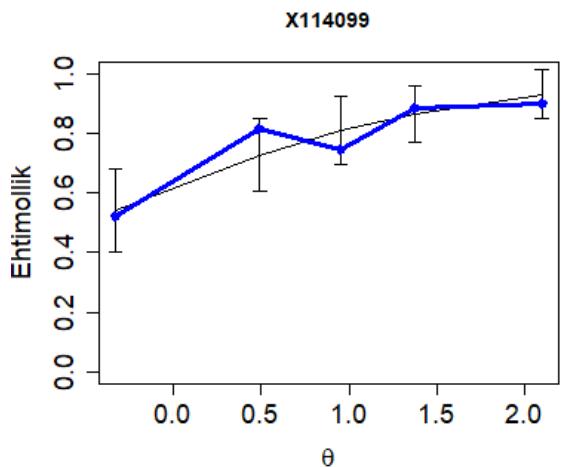
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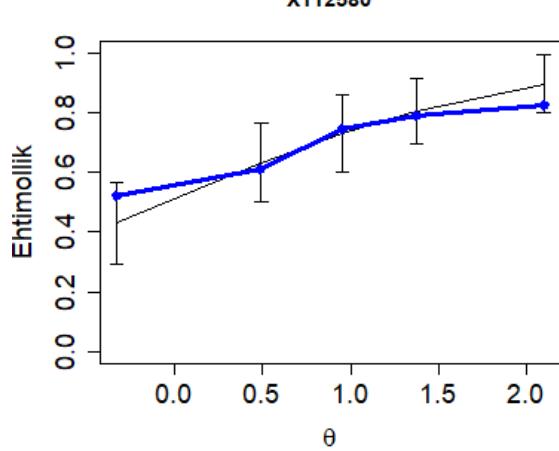
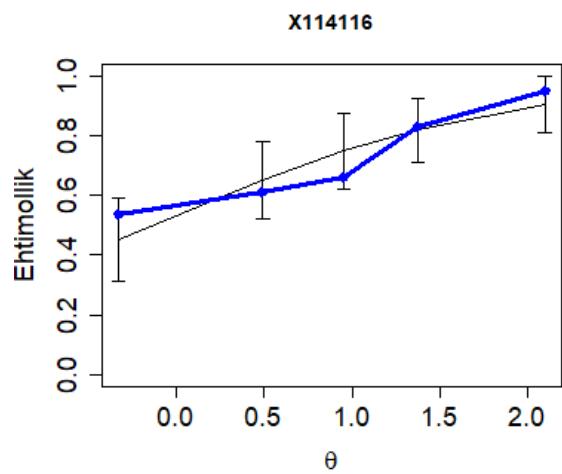
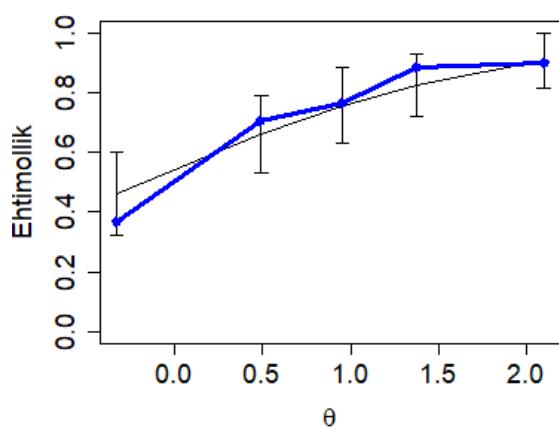
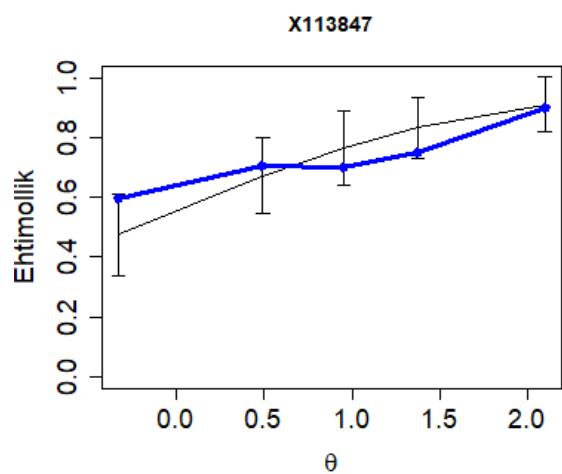
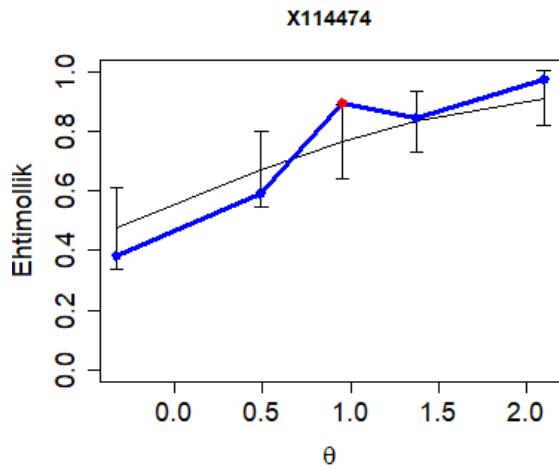
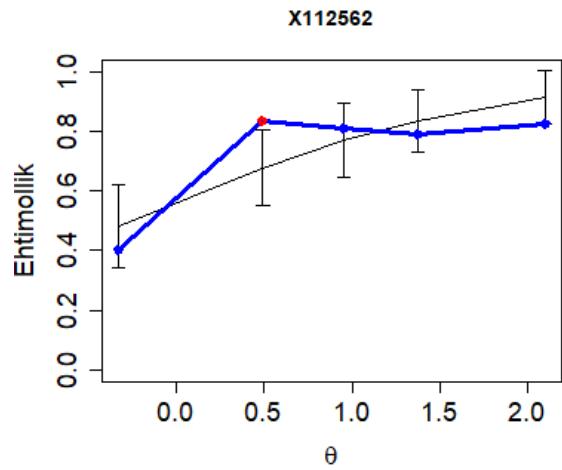
darajasi yaxshi emasligini ya'ni bunda ham ajratilgan qobiliyat guruhlarining barchasi bilan mos tushmaganligini bildiradi (5b-rasm).

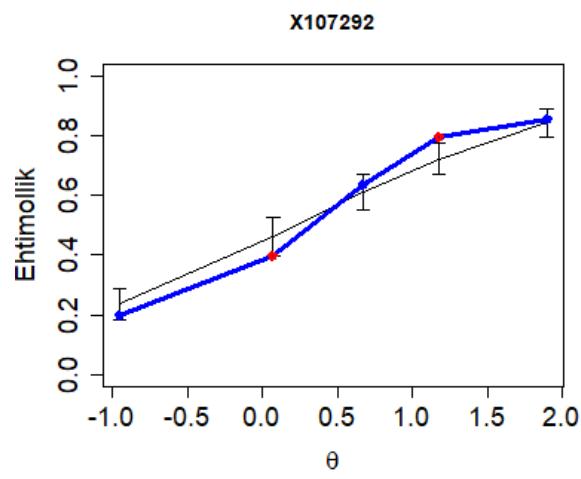
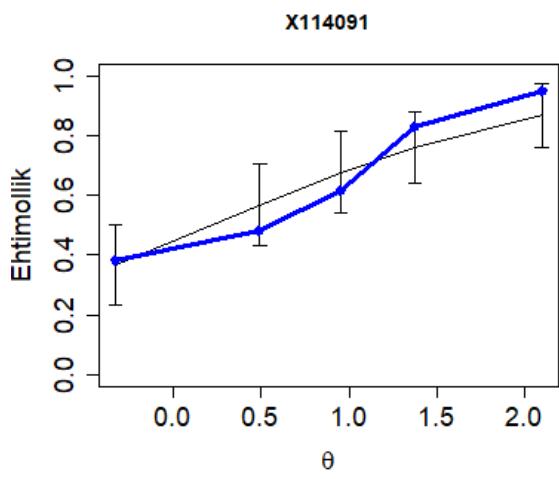
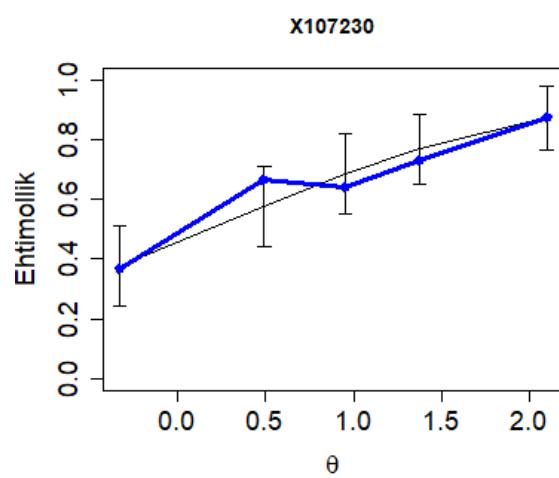
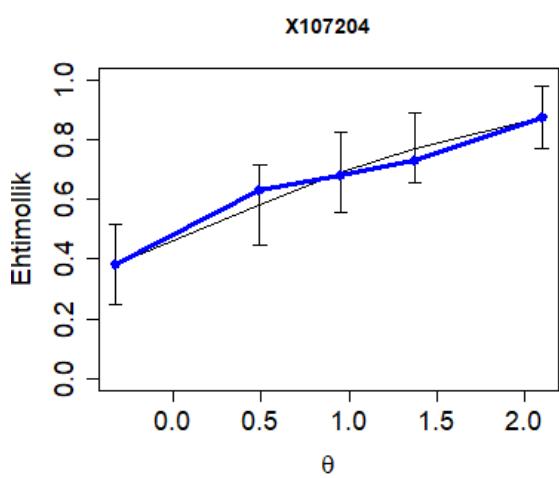
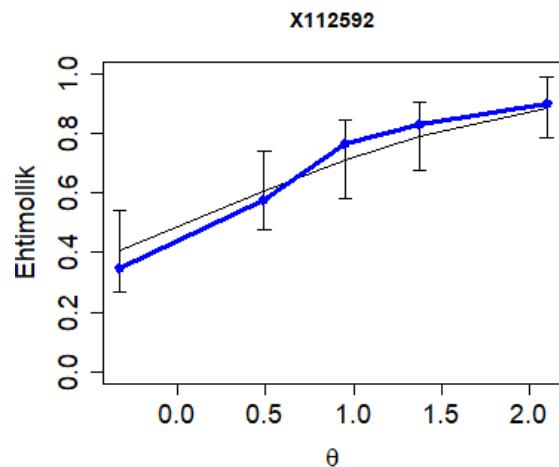
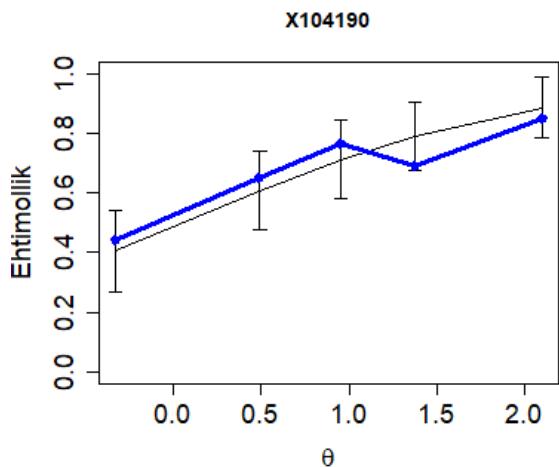


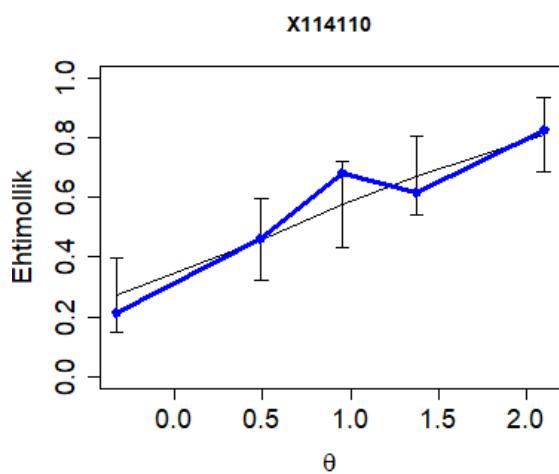
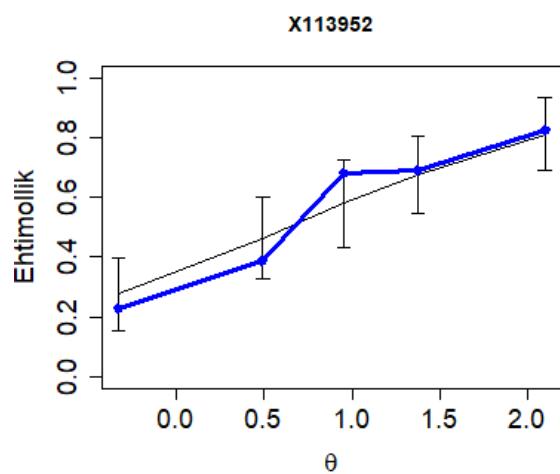
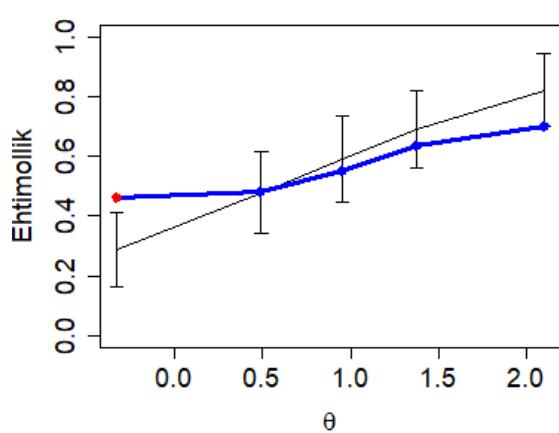
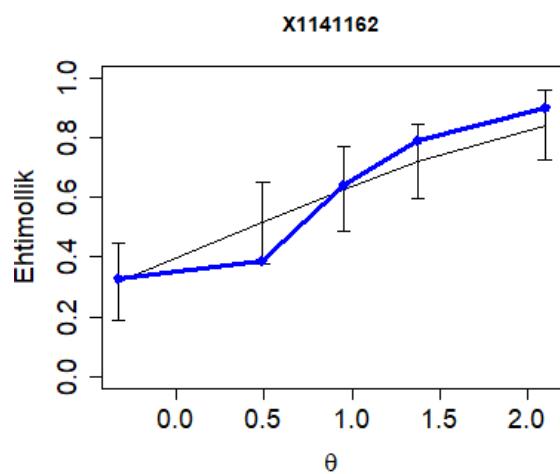
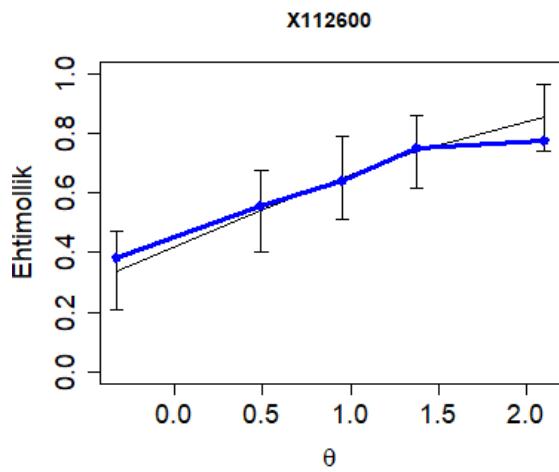
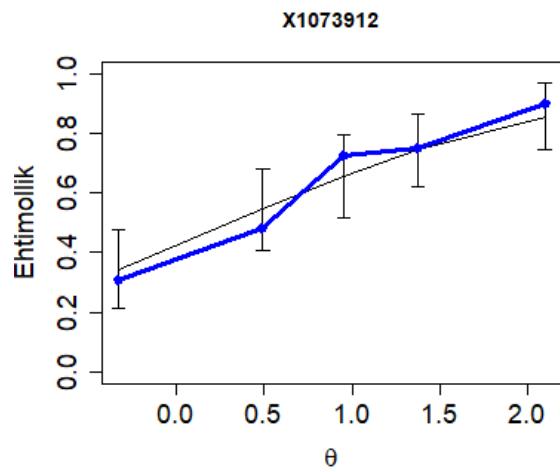




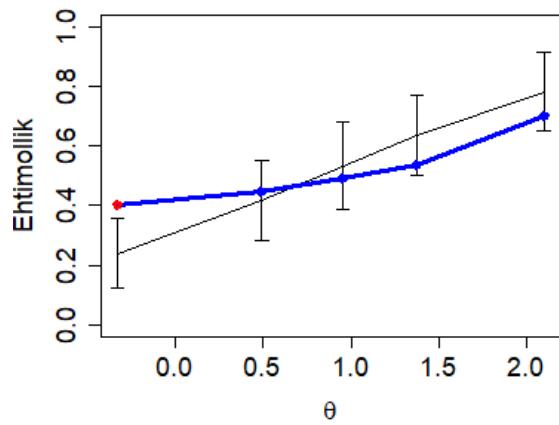




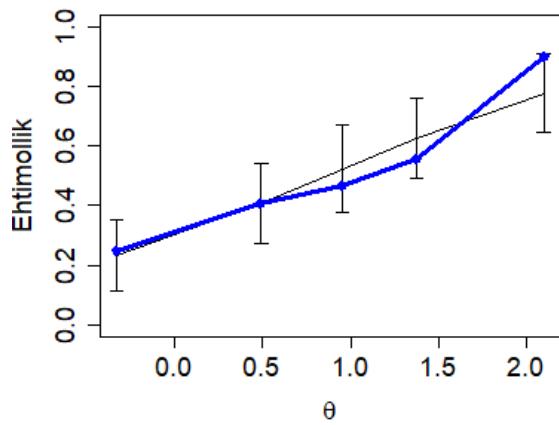




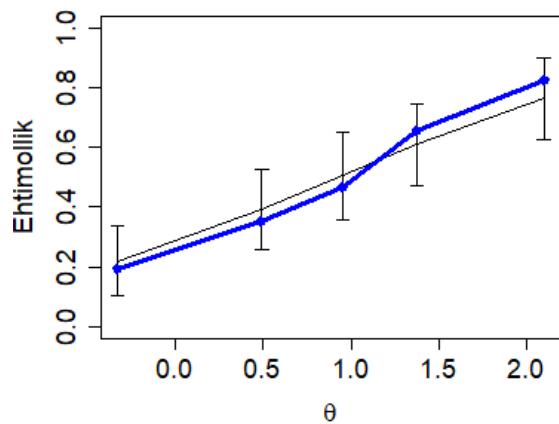
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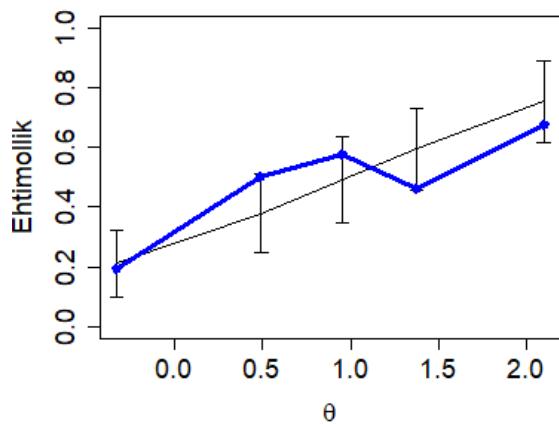
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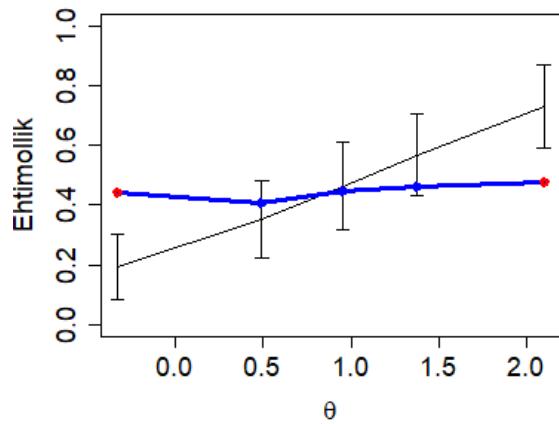
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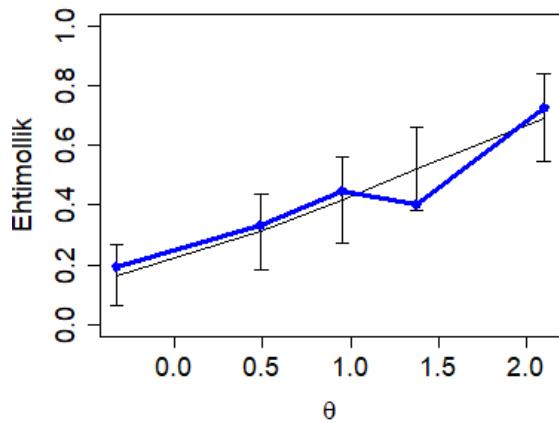
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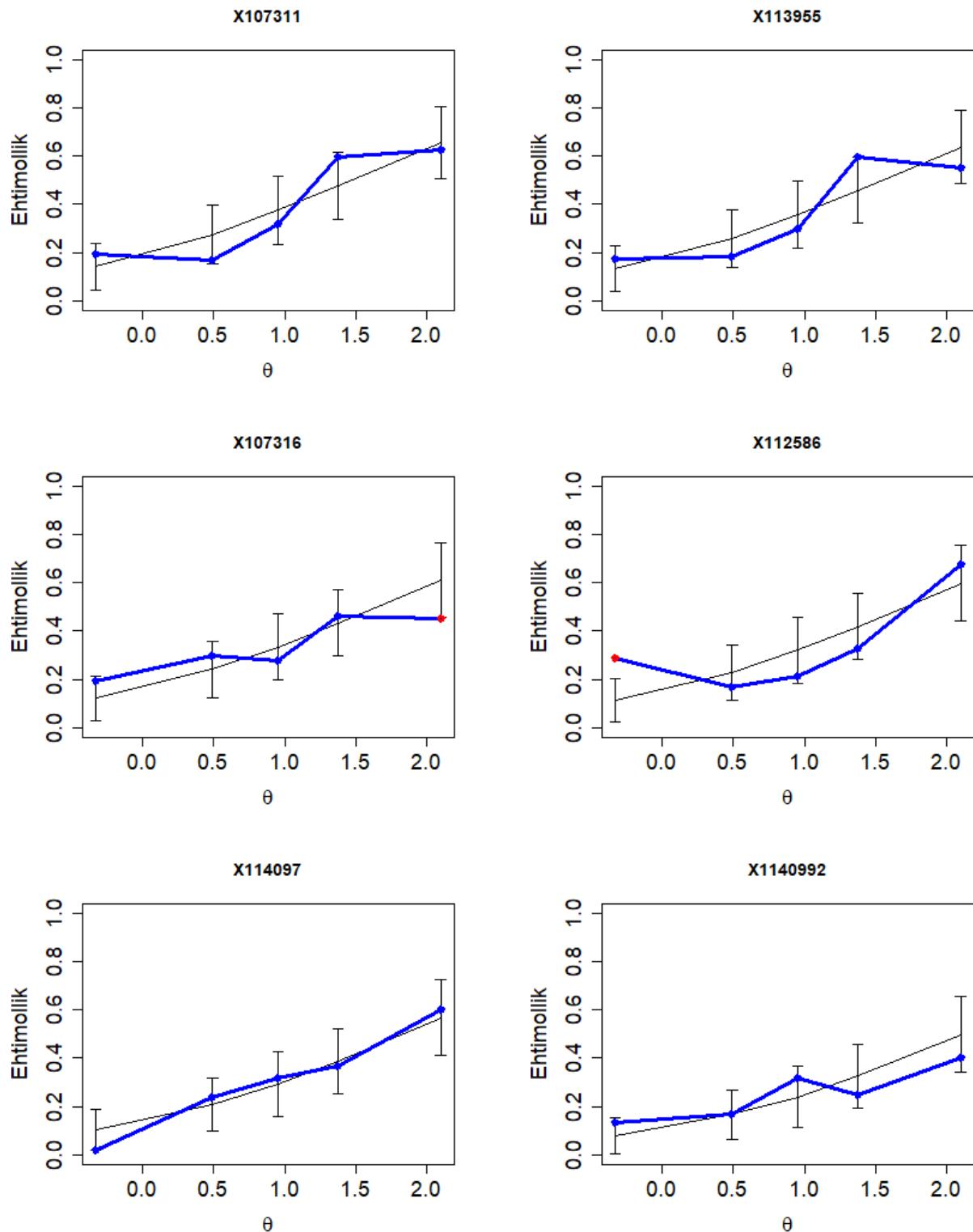


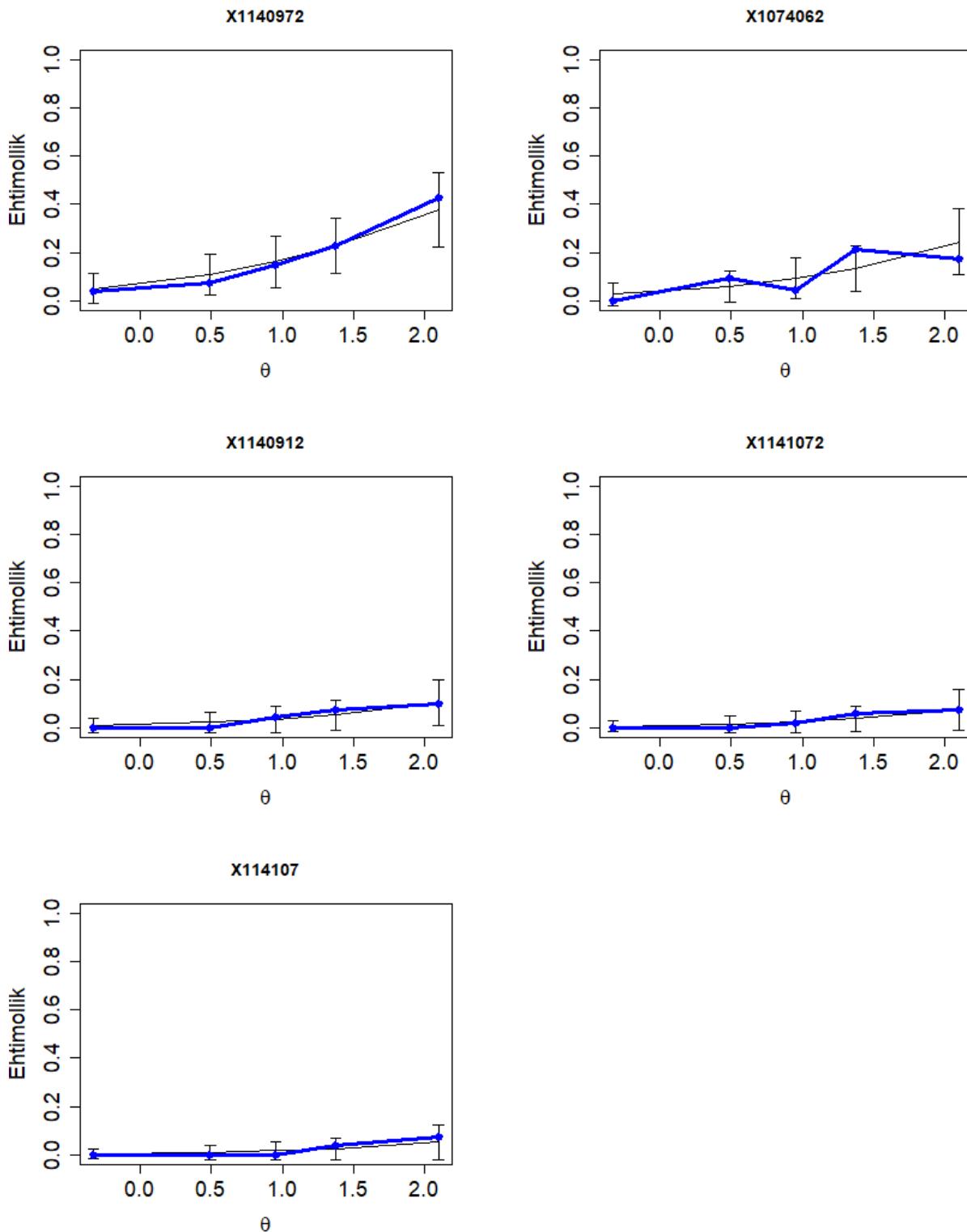
X11447434



X1141262







5b-rasm. Geografiya fanidan milliy sertifikat uchun o'tkazilgan
2-test sinovi natijalarining Rash modeli bilan mosligi

3-test sinovi tahlil natijalariga
ko'ra, ID raqamlari - 107402 va 112560
bo'lgan test topshiriqlarining Rash

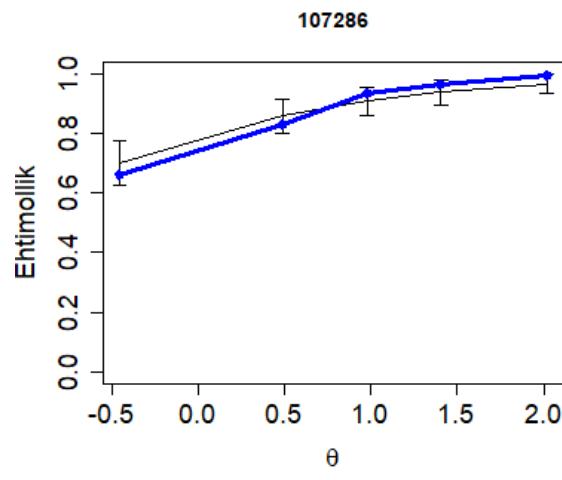
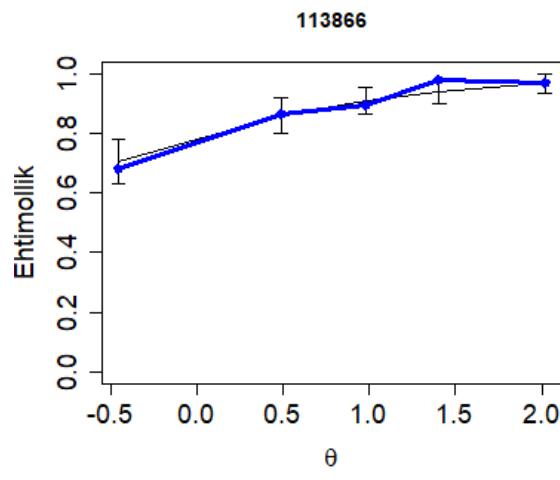
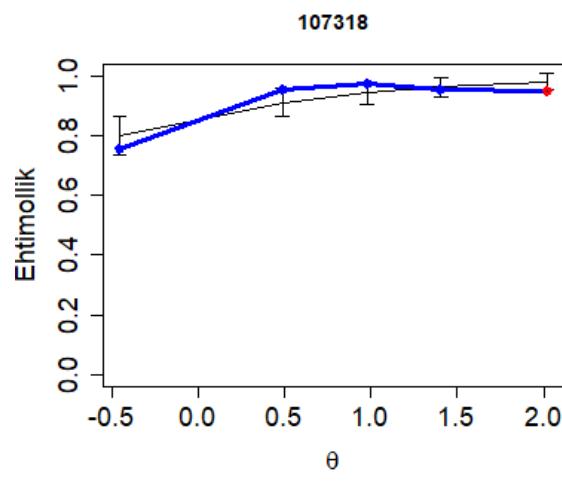
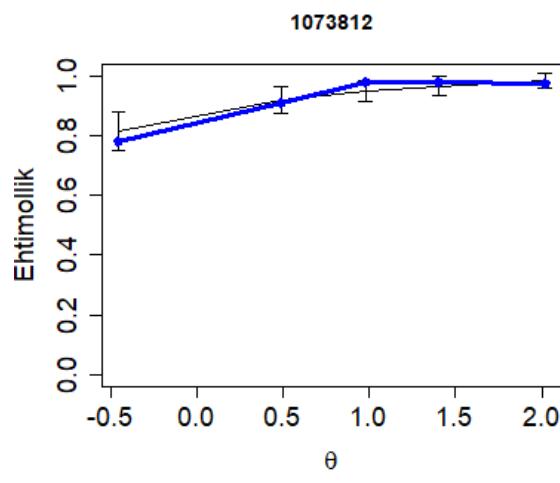
modeli bilan moslik darajasi yaxshi
emasligini ya'ni bunda ham ajratilgan
qobiliyat guruhlarining barchasi bilan

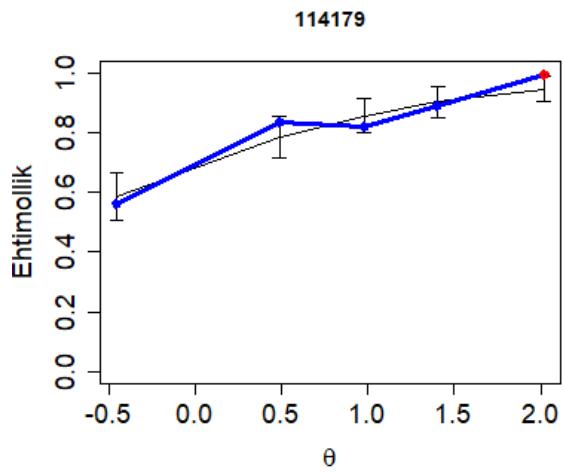
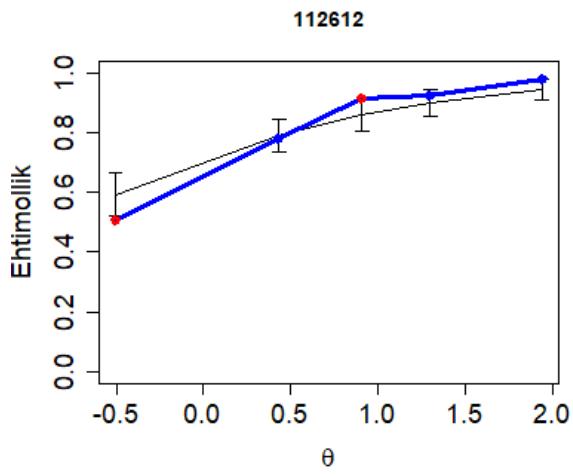
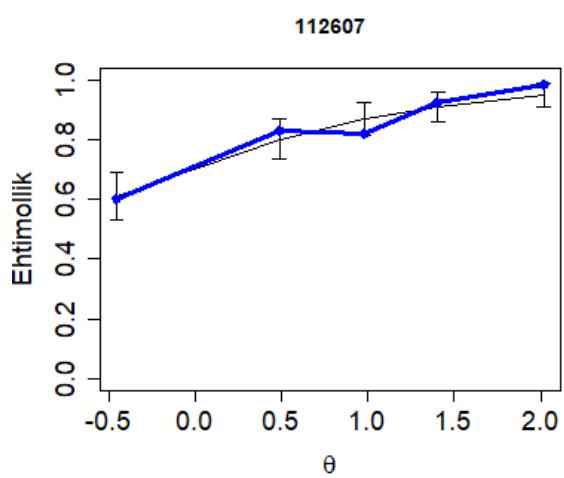
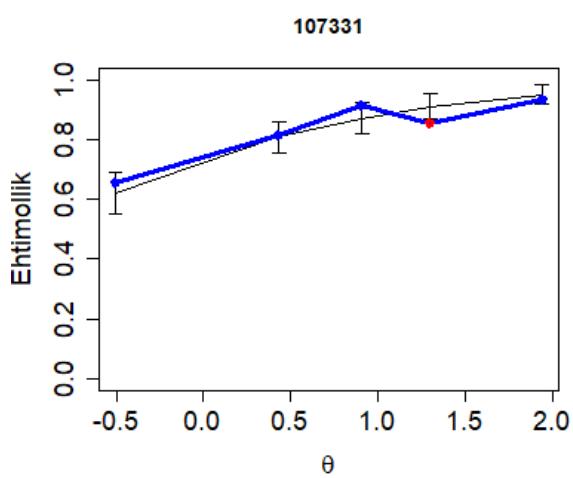
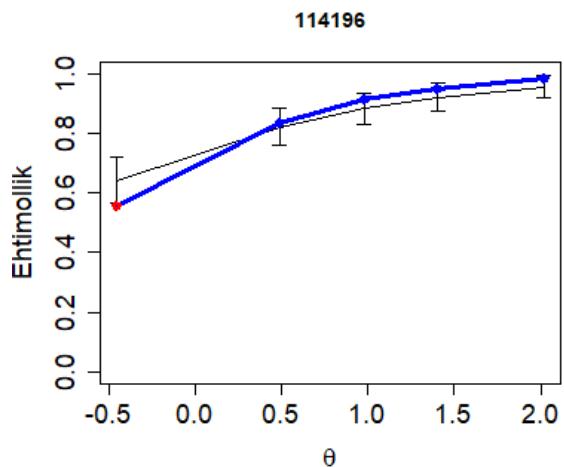
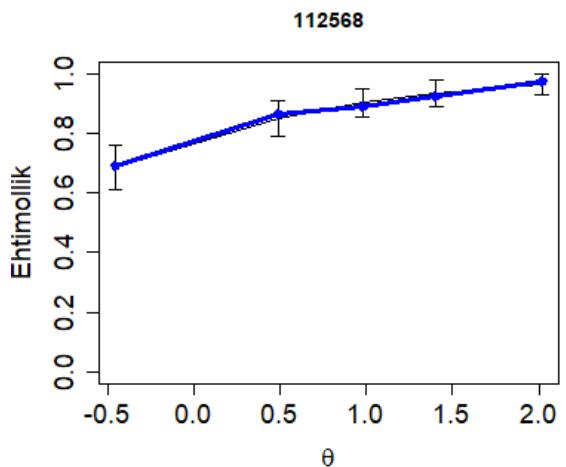
mos tushmaganligini bildiradi (5c-rasm).

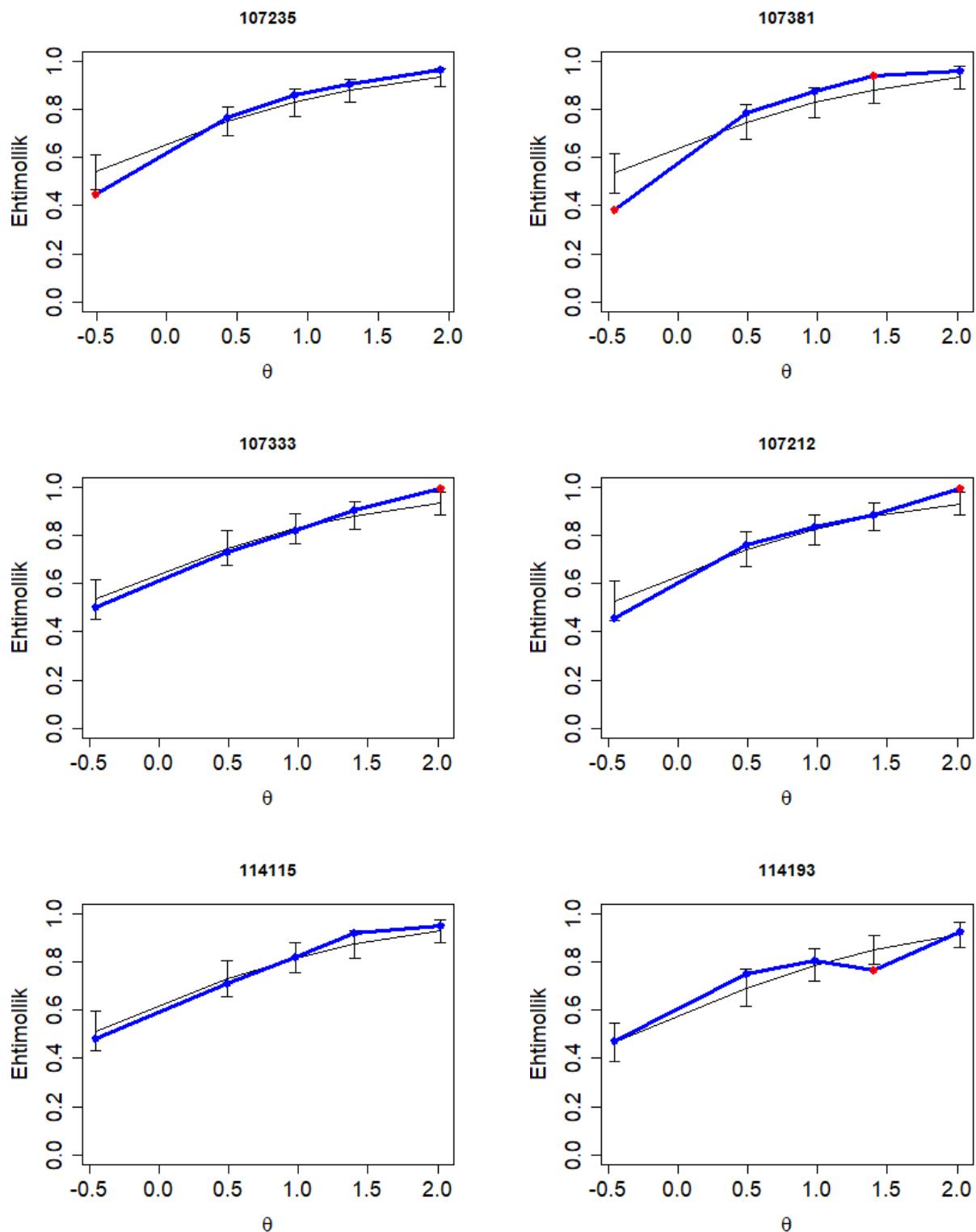
Geografiya fanidan yuqori sifatli kalibrovkalangan test topshiriqlari bazasini yaratishda yuqorida keltirilgan Rash modeli bilan mos kelmagan test topshiriqlarini kalibirovkalangan

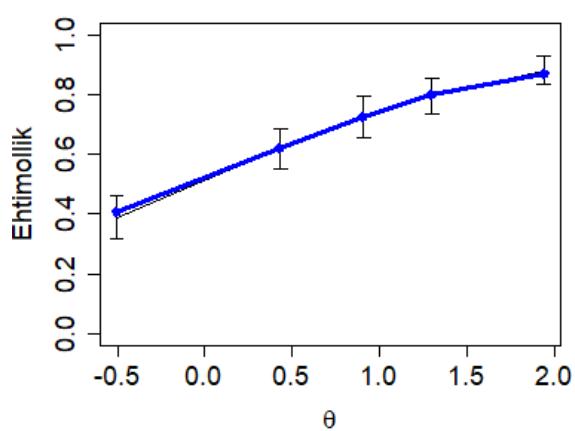
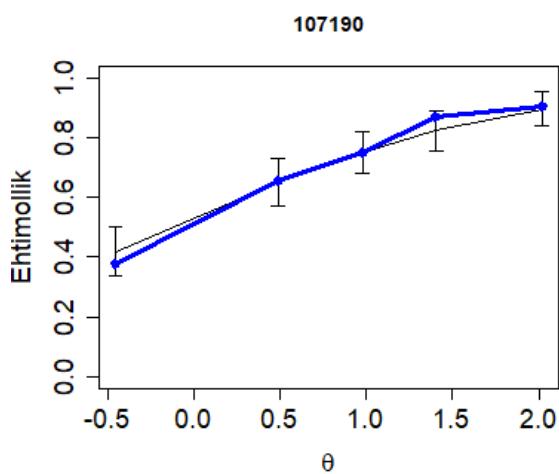
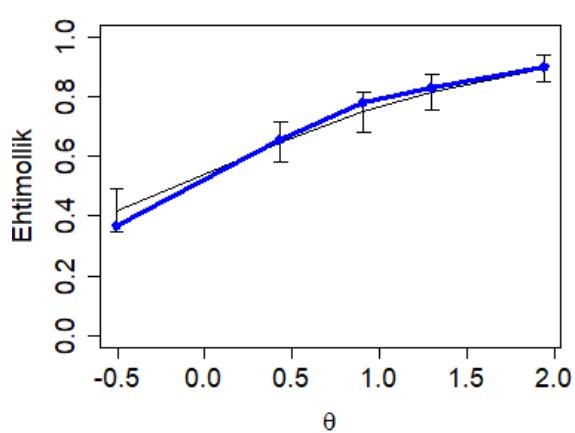
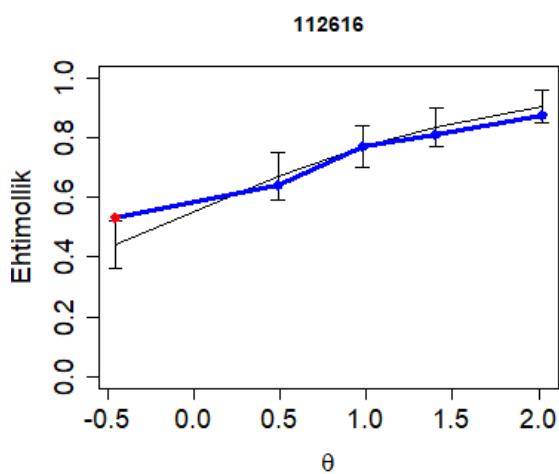
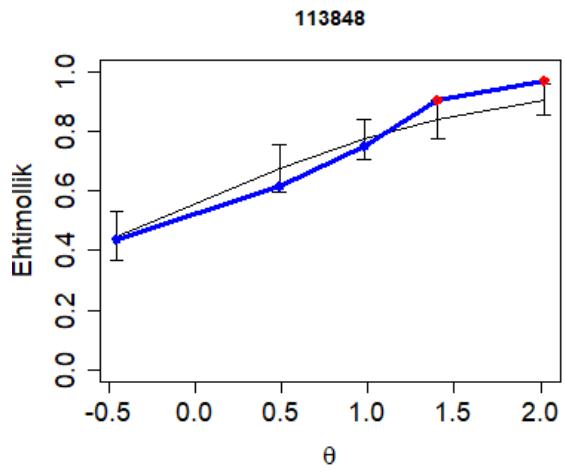
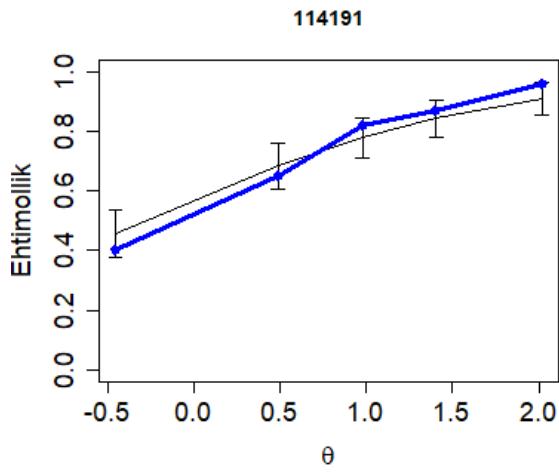
test bazasiga qo'shishdan oldin qayta ko'rib chiqish lozim.

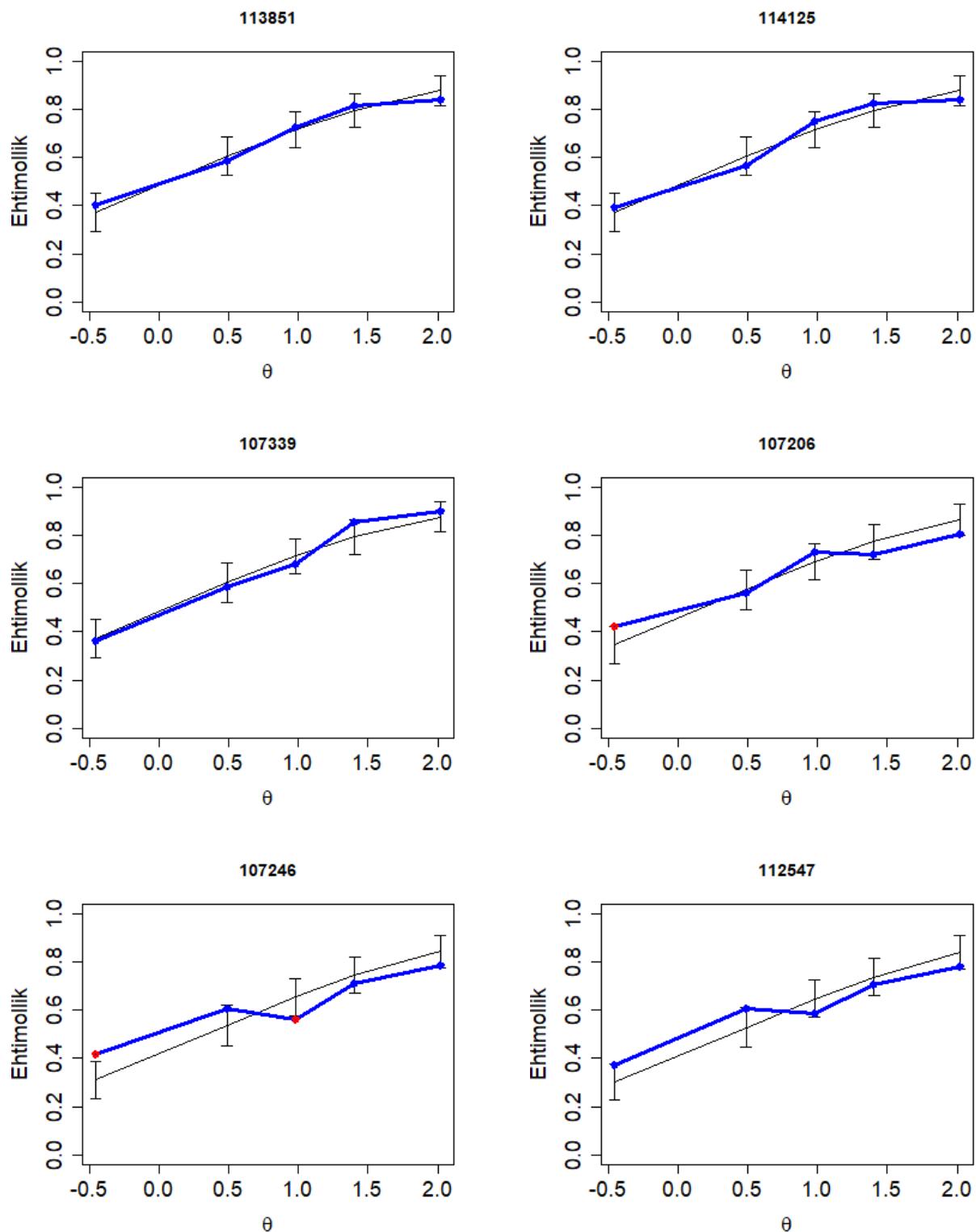
Umumiy holda test topshiriqlari xususiyatlarini Rash modelga moslashtirish muammoli elementlarni va o'ziga xos xususiyatlarga ega bo'lgan qobiliyatlarni ajratish imkonini beradi.



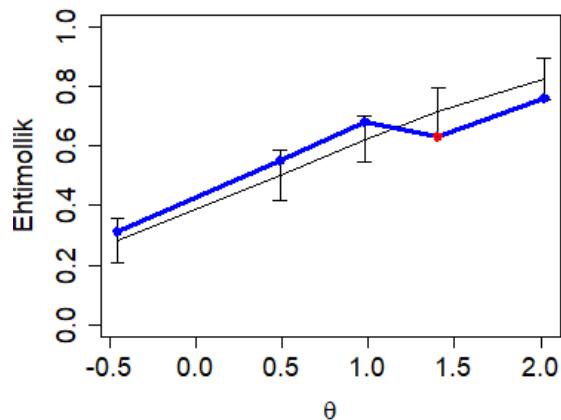




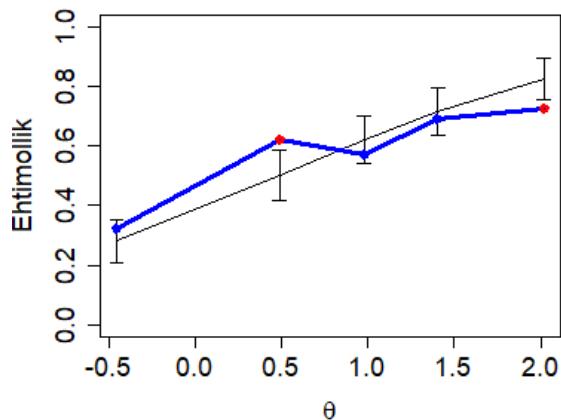




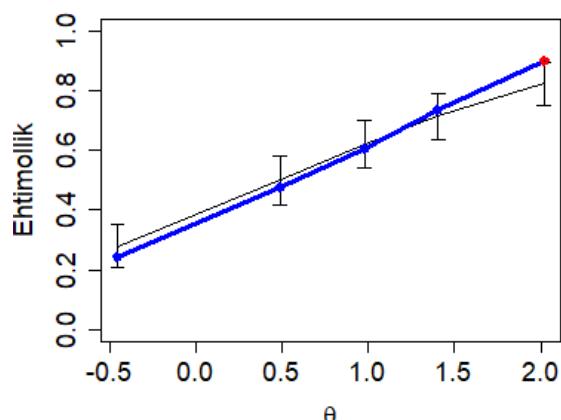
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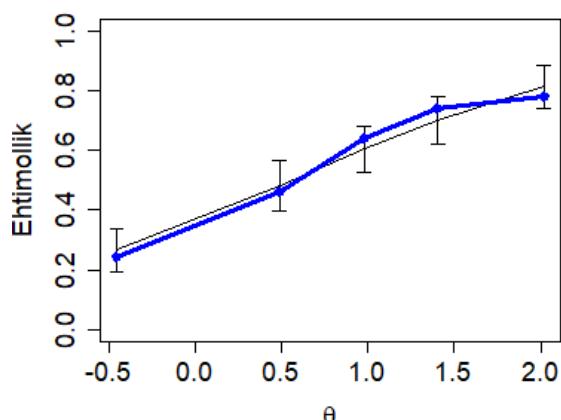
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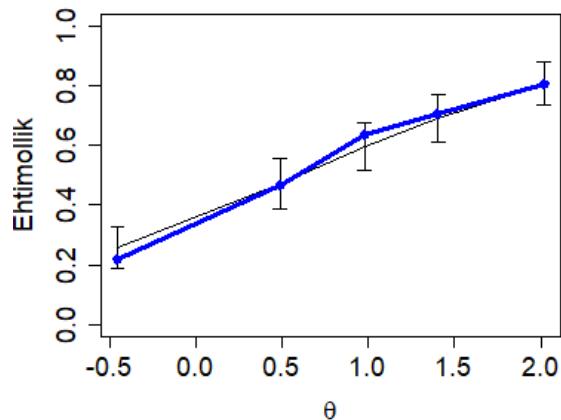
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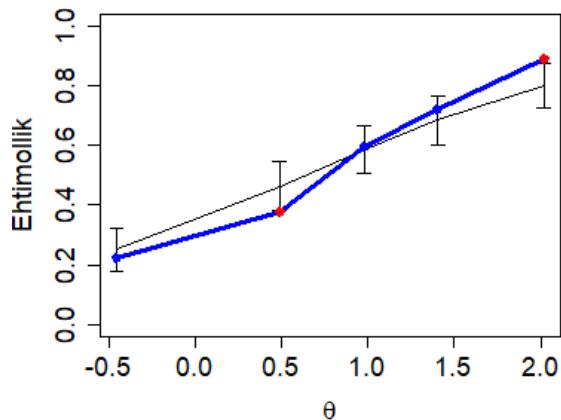
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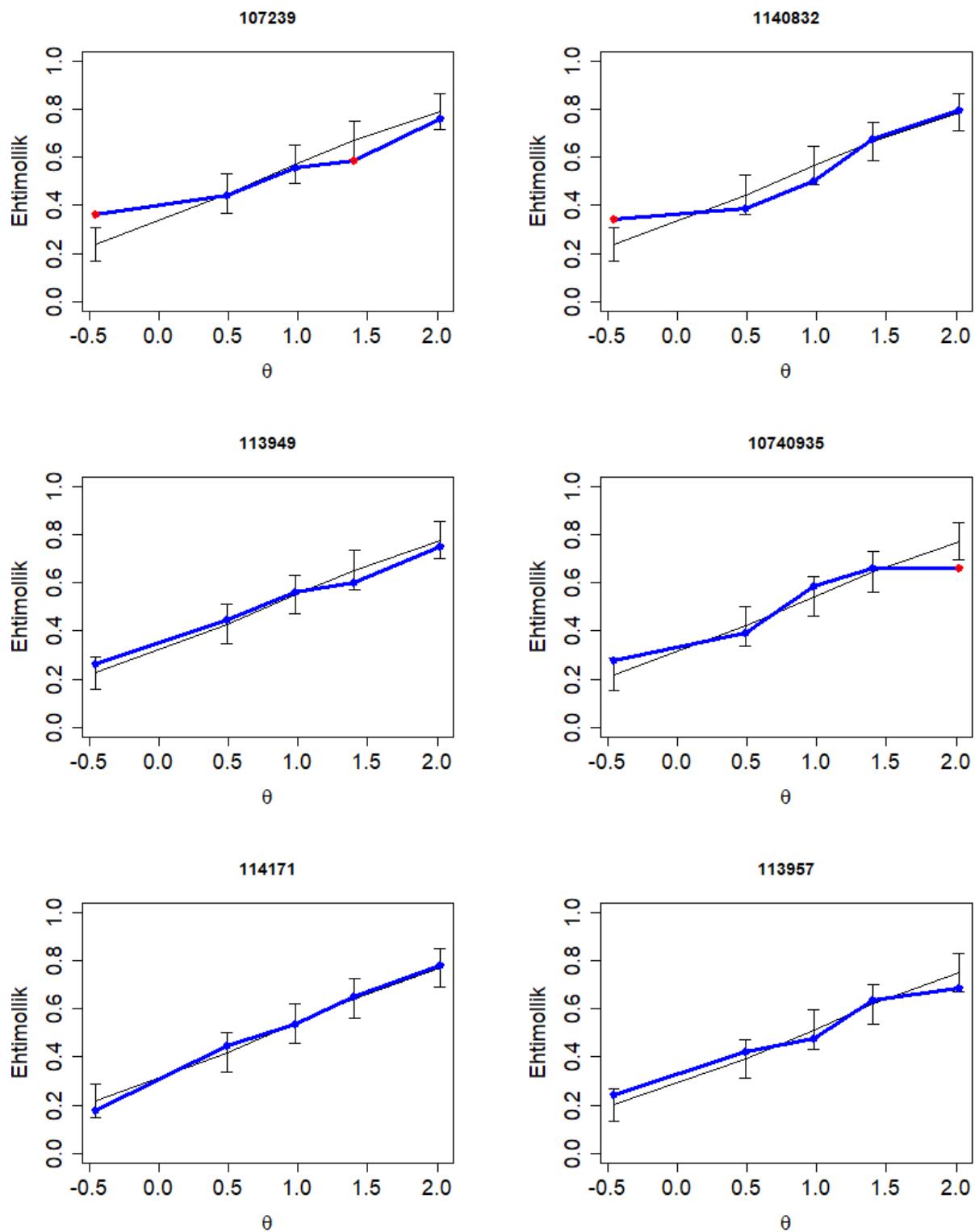


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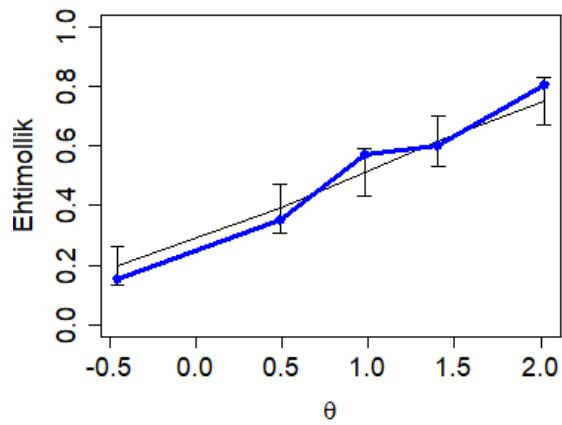


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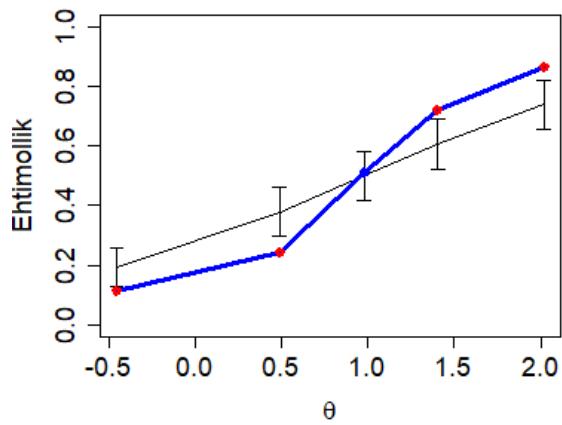




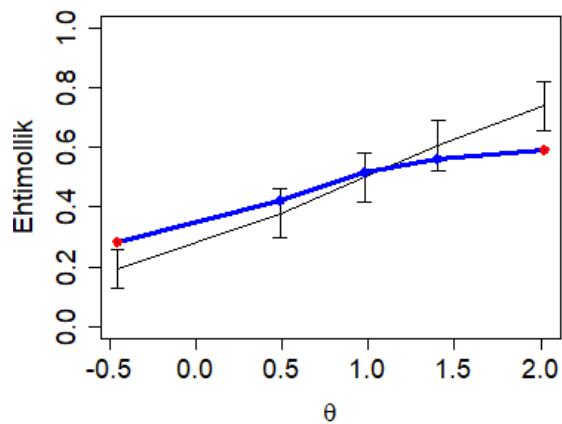
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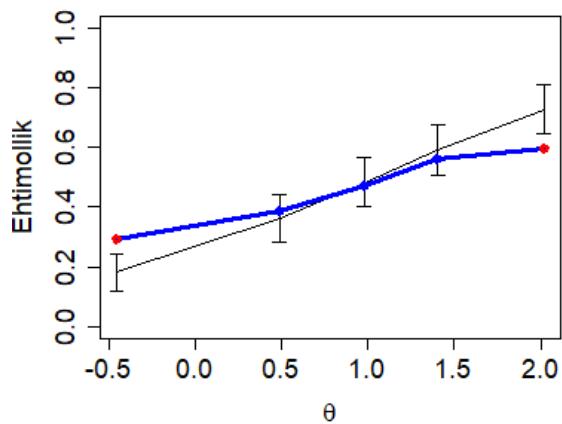
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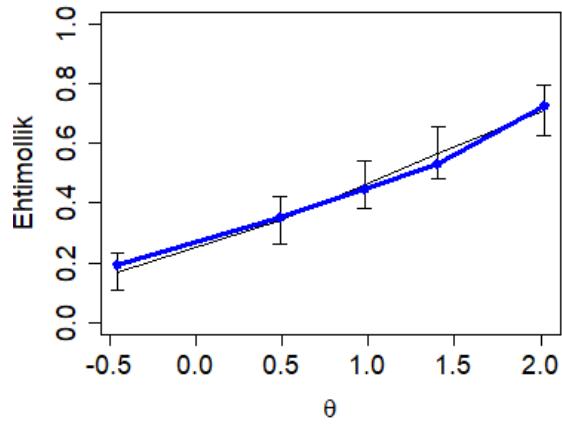
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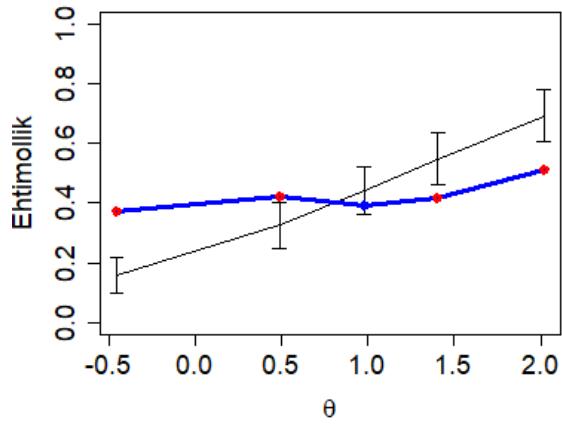
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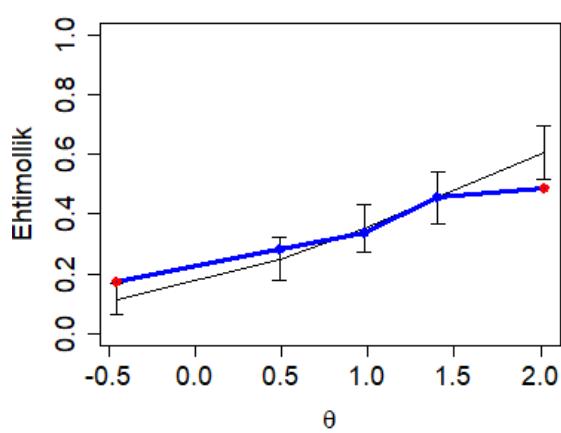
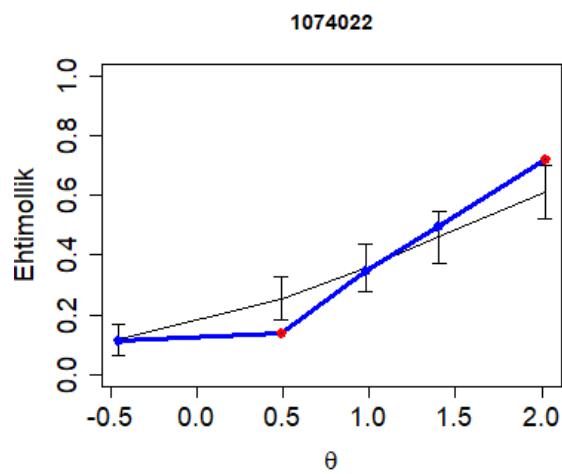
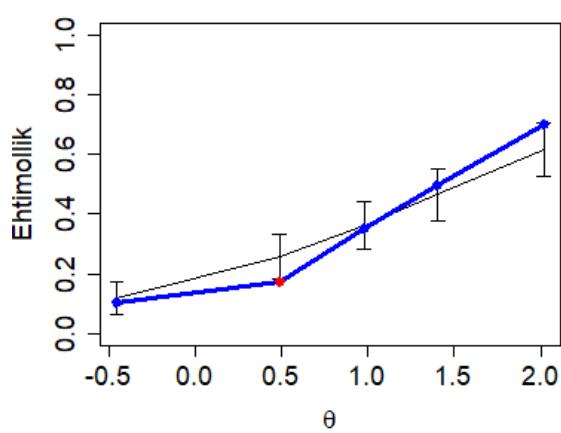
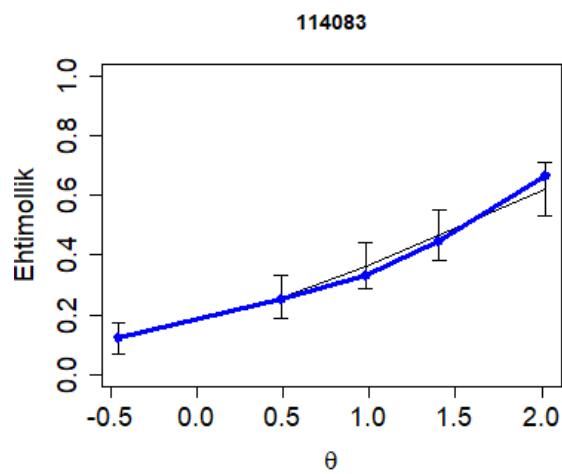
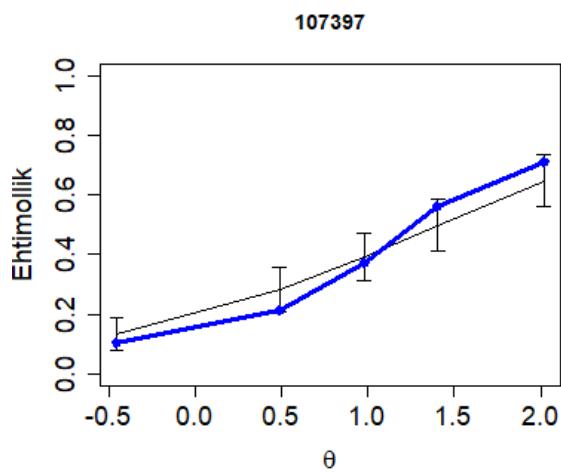
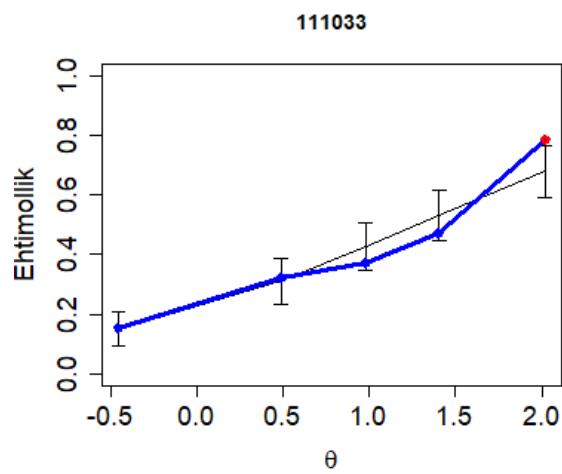


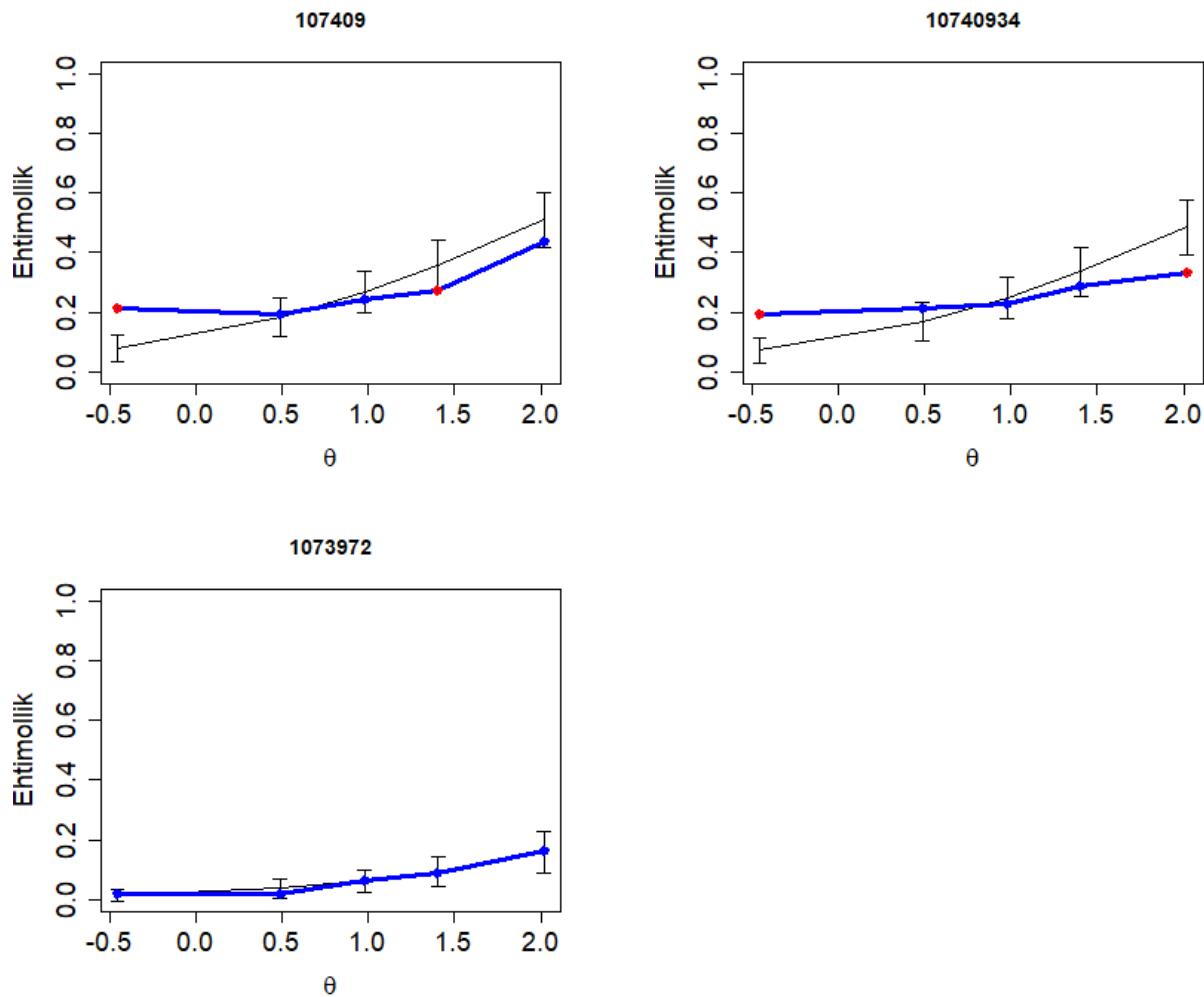
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112560







5c-rasm. Geografiya fanidan milliy sertifikat uchun o'tkazilgan
3-test sinovi natijalarining Rash modeli bilan mosligi

6-rasmda geografiya fanidan o'tkazilgan 1-, 2- va 3-test sinovi natijalari bo'yicha test ma'lumoti chiziqlari (TMCh) keltirilgan.

Test ma'lumoti chizig'i cho'q-qisining nolga nisbatan chap tomonga biroz surilganligi ushbu test varianti qobiliyat darajasi past bo'lgan talabgorlar to'g'risida va aksincha, ma'lumot chizig'i cho'q-qisining nolga nisbatan o'ng tomonga surilganligi ushbu test varianti qobiliyat darajasi yuqori bo'lgan talabgorlar to'g'risida ko'proq

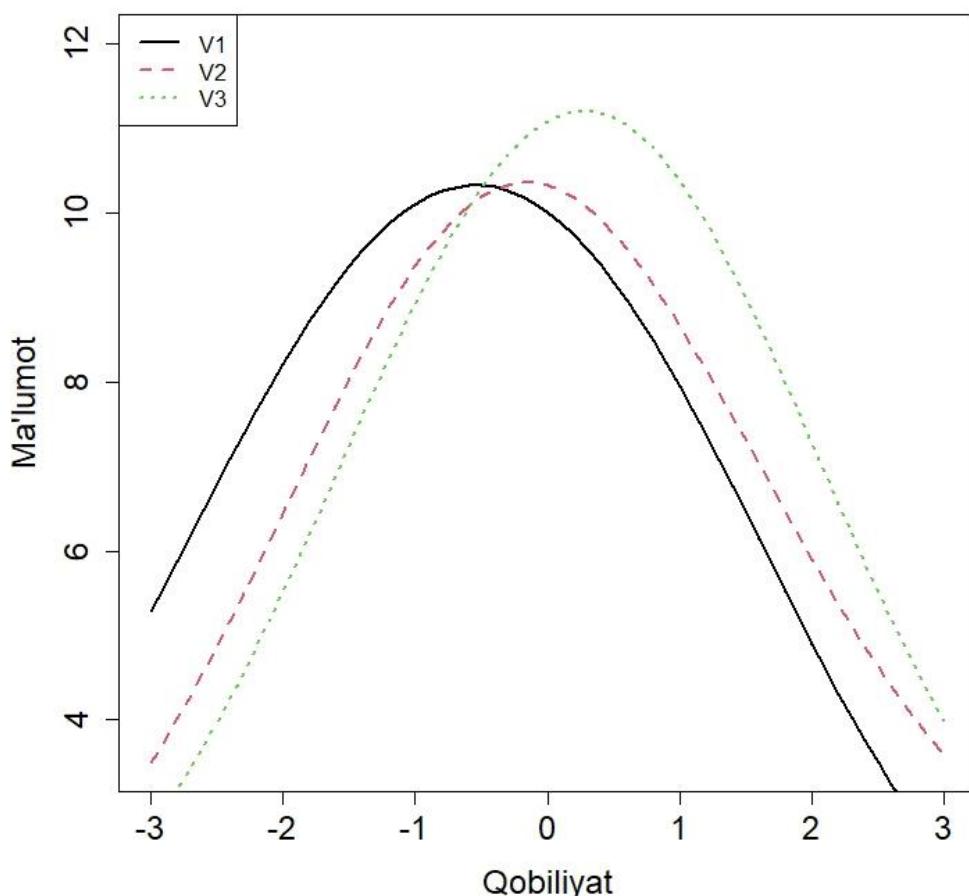
ma'lumot beradi. Test ma'lumoti chizig'i cho'qqisi nol qiymatga to'g'ri kelishi yoki juda yaqinligi esa mazkur test varianti qobiliyat darajasi past va yuqori bo'lgan talabgorlar to'g'risida teng ma'lumot beradi.

5-rasmda ko'rsatilgan test ma'lumoti chiziqlariga ko'ra, geografiya fanidan o'tkazilgan 1- va 2-test sinovi natijalari ma'lumot chiziqlari cho'qqilarining nolga nisbatan chap tomonga (1-test sinovi ko'proq, 2-test sinovi bo'yicha esa

biroz) surilganligi ushbu test variantlari orqali qobiliyat darajasi past bo'lgan talabgorlar haqida ko'proq ma'lumot olinganligini bildiradi.

3-test sinovi ma'lumot chiziqlari cho'qqisining nolga nisbatan o'ng

tomonga surilganligi esa, ushbu test varianti orqali qobiliyat darajasi yuqori bo'lgan talabgorlar haqida ko'proq ma'lumot olinganligini bildiradi.



6-rasm. Geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-(V1), 2-(V2) va 3-(V3) test sinovi natijalarining test ma'lumoti chiziqlari

7-rasmda geografiya fanidan o'tkazilgan 1-, 2- va 3-test sinovlari natijalari bo'yicha test xarakteristikasi chiziqlari keltirilgan.

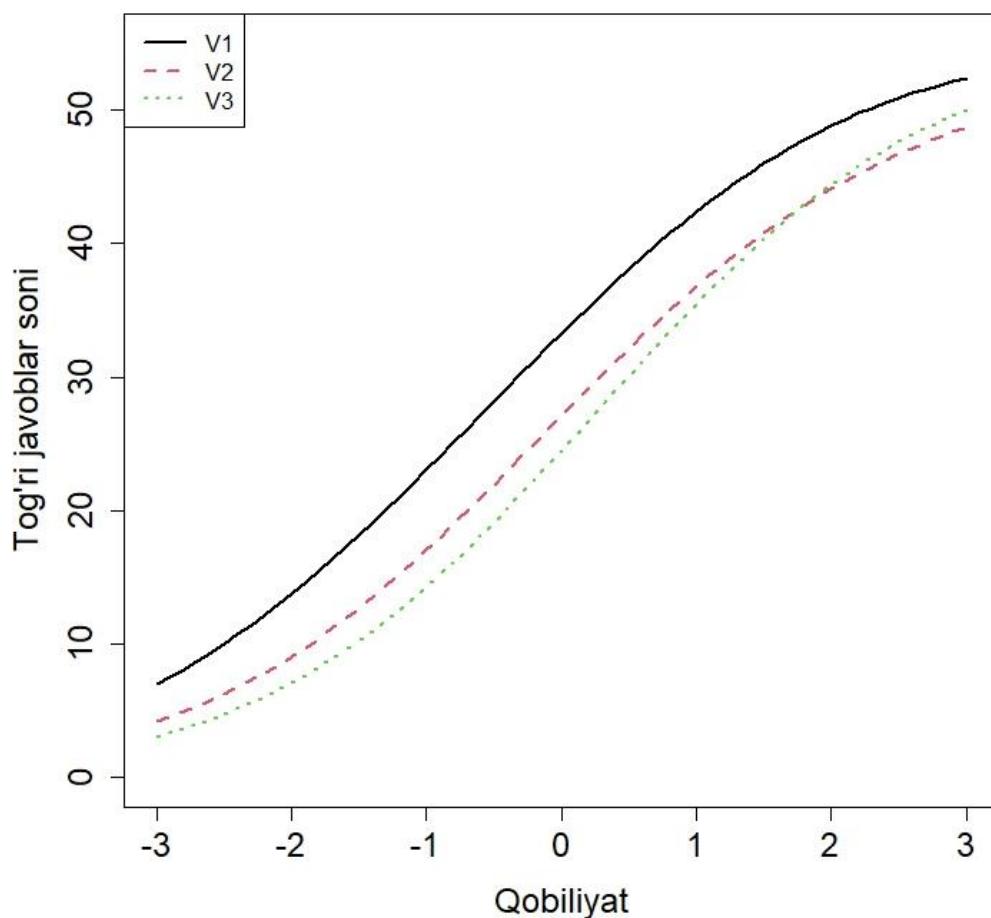
7-rasmdagi test xarakteristikasi chizig'idan to'g'ri javoblar sonining qobiliyat darajalari oshishi bilan ortib borishi ko'rindi.

Test xarakteristikasi chizig'idan 1-test sinovida ishlatilgan umumiyl elementli test varianti (V1) va 2-test sinovida foydalanilgan umumiyl elementli test varianti (V2) hamda 3-test sinovida ishlatilgan umumiyl elementli test varianti (V3) ning qiyinlik darajalarini bir-biri bilan

solishtirish mumkin. Bunga ko'ra, 1-test sinovida ishlatilgan umumiyl elementli test varianti (V1) 2- va 3-test sinovi ishlatilgan umumiyl elementli test varianti (V2, V3) ga nisbatan osonroq, 3-test sinovida ishlatilgan umumiyl elementli test varianti (V3) esa 1-test va 2-test sinovida foydalanilgan umumiyl elementli test varianti (V1, V2) ga nisbatan qiyinroq ekanligi ko'rindi.

7-rasmdan har bir variantning qiyinlik darajalari hisobga olingan

holda qobiliyatlar aniqlayotganligini ko'rish mumkin. Bu esa variantlarni qiyinligini hisobga olgan holda talabgorlarning qobiliyatlarni aniqlashda Rash modelini klassik test nazariyasiga nisbatan afzalligini bildiradi. Biroq, klassik test nazariyasi tahlil xulosalarini yanada to'ldirishini yodda tutish lozim. Shuning uchun ham odatda, test topshiriqlarining klassik test nazariyasi bilan aniqlangan xususiyatlari Rash modeli natijalari bilan birlgilikda beriladi.



7-rasm. Geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-(V1), 2-(V2) va 3-(V3) test sinovi natijalarining test xarakteristikasi chiziqlari

Xulosa

Geografiya fanidan milliy sertifikat uchun o'tkazilgan 1-, 2- va 3-test sinovlarida foydalanilgan test topshiriqlarining ishonchlilik koef-fitsiyenti (Kronbax alfa koeffitsiyenti) mos ravishda 0,84, 0,84 va 0,87 ga teng ekanligi, ishonchlilik koeffitsiyentiga qo'yilgan mezon talabi bo'yicha test topshiriqlarining o'zaro ichki muvofiqligi har uchala test varianti bo'yicha "yaxshi" darajada ekanligi ko'rsatib berildi.

Har bitta test topshirig'i bilan umumiy ball korrelyatsiya koef-fitsiyenti qiymatlari 1- va 3-qiyinlik darajasidagi test topshiriqlari uchun 0,25 dan kichik bo'lgan test topshiriqlarini o'rganib chiqib kerakli o'zgarishlar qilish, lozim bo'lsa, variantdan chiqarib tashlash maqsadga muvofiq bo'ladi. Har bitta test topshirig'i bilan umumiy ball korrelyatsiya koeffitsiyenti qiymatlari 2-qiyinlik darajasidagi test topshiriqlari uchun 0,5 dan kichik bo'lgan test topshiriqlari esa o'rganib chiqib qiyinlik darajalarini hisobga olgan holda kerakli o'zgarishlar qilish test topshiriqlarining sifatini yaxshilash uchun xizmat qiladi.

Qiyinlik darjasini bo'yicha (**-3:3**) logit birligi oralig'idan tashqarida joylashgan test topshiriqlaridan kam miqdorda ma'lumot olinishi sababli bunday test topshiriqlarining o'rniga

(**-3:3**) logit birligi oralig'iga to'g'ri keladigan qiyinlikdagi test topshiriqlaridan qo'yish maqsadga muvofiq. Biroq bunday test topshiriqlari agarda talabgorlar orasida shu test topshiriqlariga mos qobiliyatli talabgorlar bo'lsa, shunday test topshiriqlarining mavjudligi shu qobiliyatli talabgorlar to'g'risida ma'lumot beradi. Aks holda qiyinlik darjasini juda past va juda yuqori bo'lgan test topshiriqlarining o'rniga (**-3:3**) logit birligi atrofidagi test topshiriqlaridan kiritish, yuqori va past qobiliyat darajalaridan olinadigan ma'lumot miqdori orasidagi tafovutni yanada kamaytirish imkonini beradi.

Test topshiriqlari xususiyatlarini Rash modeliga moslashtirish muammoli elementlarni va o'ziga xos xususiyatlarga ega bo'lgan qobiliyatlarini ajratish imkonini beradi. Geografiya fanidan milliy sertifikat uchun o'tkazilgan test sinovlarida foydalanilgan test variantlarida 1-test sinovi bo'yicha (ID raqamlari - 101155, 101166, 101412 va 101590) bo'lgan, 2-test sinovi bo'yicha (ID raqamlari - 107322 va 11447434) bo'lgan va 3-test sinovi bo'yicha (ID raqamlari - 107402 va 112560) bo'lgan test topshiriqlarining Rash modeli bilan moslik darjasini mos tushmaganligi, ya'ni ajratilgan qobiliyat guruhlarining barchasi bilan mos tushmaganligi aniqlandi. Bunday test topshiriqlarini

ham kalibirovkalangan test bazasiga tomonidan qayta ko'rib chiqilishi lozim qo'shishdan avval mutaxassislar bo'ladi.

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TEST CHARACTERISTICS: TESTS ON GEOGRAPHY

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Abstract. This article analyzes the results on the geography tests conducted in 2024 for the national certification based on Classical Test Theory (CTT) and the Rasch model. The descriptive statistics of the test results and the correlation between individual test items and the total score are discussed. The difficulty levels of the test items used in three test administrations conducted using CTT and the Rasch model have been analyzed. Wright maps were generated for each test form based on the ability and difficulty levels identified using the Rasch model. Additionally, test data and characteristic curves, as well as the fit statistics of each test item within the test forms according to the Rasch model, were examined.

Keywords: Test items, Cronbach's alpha, difficulty, correlation coefficient, Rasch model, Wright-map, ability, fit to the Rasch model.