

FIZIKA FANIDAN MUQOBIL JAVOBLI TEST TOPSHIRIQLARI

DISTRAKTORLARINING TAHLILI

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Qisqacha mazmuni. Muqobil javobli test topshiriqlari sinaluvchilarning ta'lif tayyorgarlik darajasini aniqlashda muhim baholash vositalaridan biri hisoblanadi. Test topshiriqlarini shakllantirishda samarali distraktorlarni tanlash test tizishning muhim shartlaridan biridir. Ushbu maqolada fizika fanidan o'tkazilgan test sinovlarida foydalanilgan variantdagi 38 ta muqobil javobli test topshiriqlarining distraktori -152 ta distraktori va 10 ta qisqa javobli test topshirig'iga berilgan javoblari tahlil qilingan. Test sinovi natijalari R dasturida foydalanilgan dexter to'plami yordamida tahlil qilindi. Test topshiriqlarining distraktorlari sinaluvchilarning to'g'ri javoblarni tanlashlarida ularga kuchli yoki kuchsiz ta'sir qilishi aniqlandi.

Kalit so'zlar: Elementlar, test topshiriqlari, distraktorlar, korellyatsiya, distraktorlar chizmasi

1. Kirish

Muqobil javobli test topshiriqlari sinaluvchilarning ta'lif tayyorgarlik darajasini aniqlashda muhim baholash vositalaridan biri bo'lib, u savolni (o'zak), to'g'ri javobni (kalit) va distraktor (chalgituvchi javob)larni o'z ichiga oladi. Sifatli test topshiriqlarini shakllantirish nafaqat ko'p vaqtни, balki malakali mutaxassislarni ham talab qiladi [1].

Yaxshi tuzilgan test topshiriqlari bilan sinaluvchilarning bilimlarini samarali baholash hamda quyi va yuqori darajadagi o'zlashtiruvchi sinaluvchilarni yaxshi ajratish imkonи mavjud. Muqobil javobli test topshiriqlari sinaluvchilarda shakllangan quyi va yuqori kognitiv darajalar haqida ilmiy

va asosli xulosalar berishga xizmat qilishi kerak. [2-4].

Test topshiriqlarini shakllantirishda samarali distraktorlarni tanlash muhim hisoblanadi. Muqobil javobli test topshiriqlarining o'zak qismi va distraktorlarini tuzishda mutaxassislardan yuqori malaka va tajriba talab qiladi [5].

Distraktorlar sinaluvchilarda shakllangan noto'g'ri tasavvurlarni va konsepsiyalarni o'z ichga olganligi sababli ular ichidan to'g'ri javobni (kalit) tanlay olish qobiliyatini talab qiladi. Shuning uchun ham distraktorlarni tahlil qilish – har bir test topshirig'iga biriktirilgan barcha javoblarning samaradorligini nazariy va empirik jihatdan o'rganishga imkon

beradi [6]. Test topshiriqlarini tahlil qilish murakkab jarayon bo'lib, imtihon o'tgandan so'ng amalga oshiriladi va test topshirig'ining ishonchliligi va asosliligi haqida ma'lumot beradi.

Test topshiriqlarini, to'g'ri javob va distraktorlarni shakllantirishda qoidalarga amal qilmaslik sinaluvchilarning haqiqiy bahosiga salbiy ta'sir ko'r-satishi mumkin [7, 8]. Ba'zi hollarda chalg'ituvchi bilan bog'liq kamchiliklarni aniqlash va ularni bartaraf qilish distraktorlarning samaradorligini oshirishi va obyektning qiyinligi va diskriminatsiya ko'rsatkichlariga ijobiy ta'sir qilishi mumkin[9].

Mezon sifatida 5 foizdan kam tanlangan distraktorlar o'z vazifasini bajarmaydigan distraktorlar deb olinadi [10], shuning uchun bu distraktorlarni o'zgartirish tavsiya qilinadi.

Yuqori sifatli muqobil javobli test topshiriqlari aniq lo'nda, o'lchanayotgan domenni (yoki konstruktni) aniq bir elementini o'lhashga qaratilgan, konstrukt uchun muhim bo'lgan bilimga asoslangan, ortiqcha ma'lumotlardan xoli, grammatic, uslubiy va imlo xatolarsiz yozilgan o'zakni hamda bir qancha distraktorlarni oqilona tanlashni talab qiladi.

Test topshirig'ining o'zagi bitta to'liq fikrni o'z ichiga olishi, mustaqil, subyektiv munosabat va subyektiv

bahoni ifodalamasligi talab etiladi. O'z navbatida to'g'ri javob va distraktorlarni shakllantirishda ham bir qancha talablar qo'yiladi: javoblardan faqat bittasi to'g'ri javob (kalit) bo'lishi; testda to'g'ri javoblar turli o'rnlarda joylashishi va to'g'ri javoblarning joylashuvida qandaydir qolip bo'lmasligi; to'g'ri javobda "doim", "hech qachon", "eng" kabi so'zlarni, topshiriq o'zagida ishlatilgan so'zlarni ishlatmaslik; distraktorlar mantiqiy ketma-ketlikda joylashishi; distraktorlar ma'no jihatdan bir-birini qamrab olmasligi va bir turkumga mansub bo'lishi; distraktorlar grammatik bir xil shaklda bo'lishi; distraktorlarning uzunligi bir-biriga yaqin bo'lishi; distraktorlar asosli tanlanishi, tekshirilayotgan domenni yaxshi o'zlashtirmagan test topshiruvchiga kalit kabi ko'rinishi kerak.

Ushbu maqolada umumiyoq o'rta ta'lim maktabalarining 11-sinf o'quvchilaridan fizika fani bo'yicha o'tkazilgan aprobatсиya test sinovlarida foydalanilgan test topshiriqlarining distraktorlari tahlil qilindi. Test sinovlarida jami 48 ta, jumladan, 38 tasi yopiq turdag'i, 10 tasi esa ochiq turdag'i test topshiriqlaridan foydalanildi. Test topshiriqlarining natijalarini tahlil qilishda R dasturida ishlatiladigan dexter to'plamidan foydalanildi [11].

2. Distraktorlar tahlili

Test topshiriqlarining distraktorlarini tahlil qilishda foydalanilgan

dastur [11] bilan olingan distraktorlar chizmasi variantdag'i har bitta javoblar

tanlanmasi nisbiy chastotasining parametrik bo'limgan regressiyani ko'rsatadi [5]. Bunda ballar yig'indisida javob berilmagan tanlovlardan hisobga olinadi. 1- va 2-jadvallarda mos ravishda sinaluvchilarning yopiq va ochiq test topshiriqlariga javob-

larning foizdagi tanlovi berilgan. 1-jadvalda muqobil javoblar A, B, C va D bilan tanlamaganlar esa (NA) bilan belgilangan. 2-jadvalda esa to'g'ri javoblar A raqami bilan, noto'g'ri javoblar B raqami bilan belgilangan

1-jadval

Yopiq turdag'i test topshiriqlariga sinaluvchilarning muqobil javoblarni (A, B, C va D) tanlaganlar hamda tanlamaganlar (NA) foizi (soni) va kalitlar

№	Muqobil javoblar				NA	Kalit
	A	B	C	D		
1	5(21)	75(312)	17(72)	2(7)	0,7(3)	B
2	22(93)	54(226)	16(65)	7(31)	0	B
3	3(14)	9(37)	20(84)	67(276)	1(4)	D
5	21(87)	49(204)	19(80)	11(44)	0	B
6	15(64)	32(133)	10(42)	42(175)	0,2(1)	B
7	18(75)	51(213)	18(75)	12(50)	0,5(2)	B
8	37(155)	24(100)	20(85)	16(67)	2(8)	A
9	20(83)	55(228)	14(60)	10(43)	0,2(1)	B
11	19(78)	24(98)	22(91)	11(47)	0,2(1)	C
12	13(55)	48(199)	30(125)	8(35)	0(1)	B
14	44(183)	24(101)	18(73)	13(55)	0,7(3)	A
15	21(86)	27(113)	28(116)	19(77)	0,7(3)	B
17	22(91)	54(224)	16(68)	8(32)	0	B
18	12(50)	65(269)	16(66)	6(25)	1,2(5)	B
19	36(151)	27(112)	25(104)	11(46)	0,5(2)	B
21	11(44)	21(86)	59(244)	9(38)	0,7(3)	C
22	42(176)	19(77)	26(107)	12(51)	1(4)	B
23	14(58)	40(165)	30(126)	15(63)	0,7(3)	A
24	31(127)	31(128)	27(111)	11(46)	0,7(3)	C
25	26(107)	20(83)	23(96)	31(129)	0	C
26	24(98)	25(104)	33(138)	17(72)	0,7(3)	C
28	17(72)	36(148)	36(150)	10(42)	0,7(3)	C
30	28(117)	25(105)	32(132)	14(59)	0	A
31	16(65)	22(90)	40(168)	21(80)	1(4)	C
32	38(158)	25(105)	23(97)	12(50)	1,2(5)	A
33	21(88)	44(183)	16(66)	18(75)	0,7(3)	B

34	26(108)	26(109)	29(122)	17(72)	1(4)	D
35	43(108)	19(77)	29(119)	9(37)	0,4(2)	A
36	19(80)	30(125)	21(89)	29(119)	0,4(2)	A
37	18(73)	41(169)	27(111)	15(61)	0,2(1)	B
39	47(194)	24(98)	17(71)	13(52)	0	C
40	14(57)	27(110)	21(86)	39(160)	0,4(2)	B
41	28(115)	30(124)	32(131)	11(45)	0	C
43	19(77)	36(149)	29(121)	15(62)	1,5(3)	C
45	23(96)	44(181)	17(70)	16(66)	0,4(2)	B
46	18(76)	15(63)	52(217)	14(57)	0,4(2)	C
47	62(259)	15(62)	15(62)	8(32)	0	A
48	18(76)	22(92)	39(163)	20(83)	0,2(1)	C

2-jadval

Ochiq qisqa javobli test topshiriqlariga sinaluvchilarning to'g'ri (A) va noto'g'ri javoblari (B) foizi (soni)

Nº	A	B	NA
4	45(186)	41(170)	45(186)
10	24(100)	62(259)	13(56)
13	25(103)	49(205)	26(106)
16	28(118)	40(164)	32(133)
20	4(16)	63(261)	33(138)
27	14(58)	65(268)	21(89)
29	8(34)	47(193)	45(188)
38	8(34)	56(234)	35(147)
42	17(72)	42(174)	41(169)
44	11(45)	37(155)	52(215)

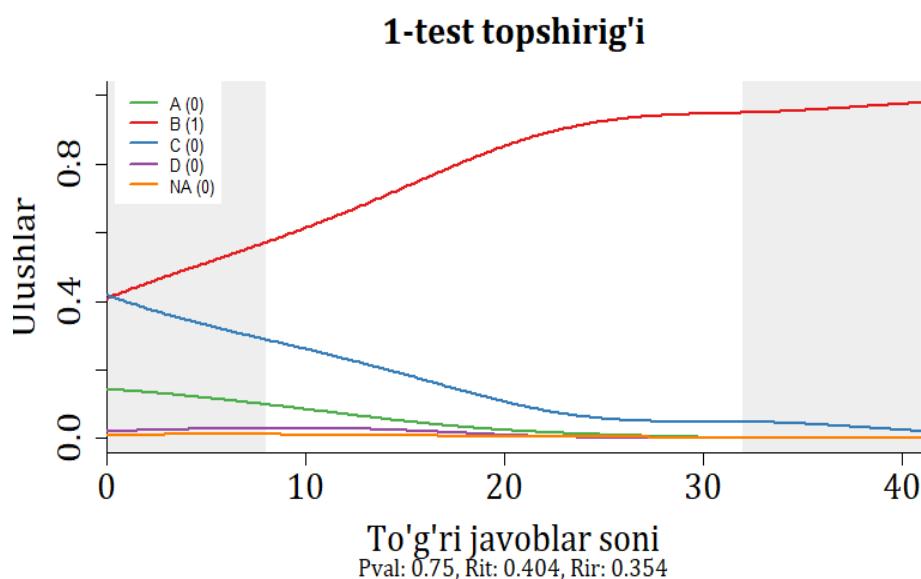
1-jadvalda fizika fani bo'yicha berilgan test topshiriqlarining distraktorlar tahlili keltirilgan bo'lib, ulardan 1-test topshirig'ining "A" distraktorini 5% (jami sinaluvchilarning 21 nafari), "D" distraktorini 2% (jami sinaluvchilarning 7 nafari) va 3-test topshirig'ining "A" distraktorini esa 3% (jami sinaluvchilarning 14 nafari) ishtirokchi javob sifatida

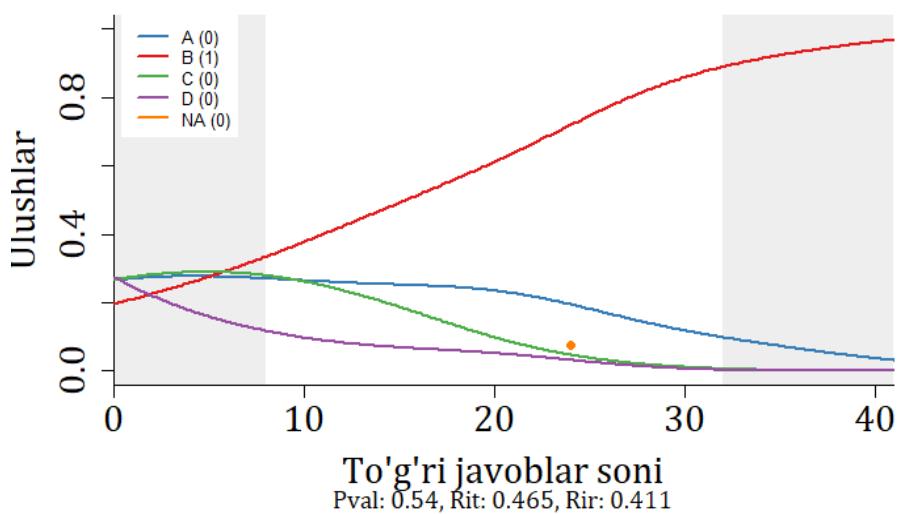
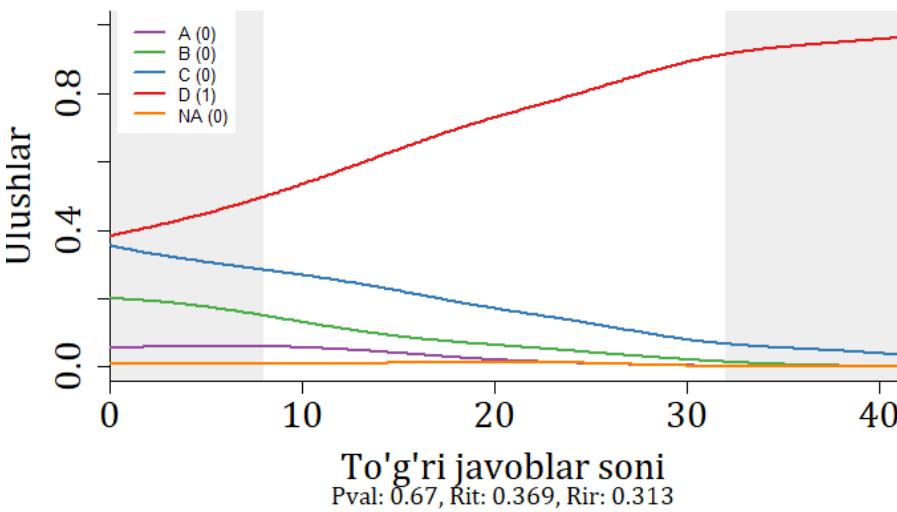
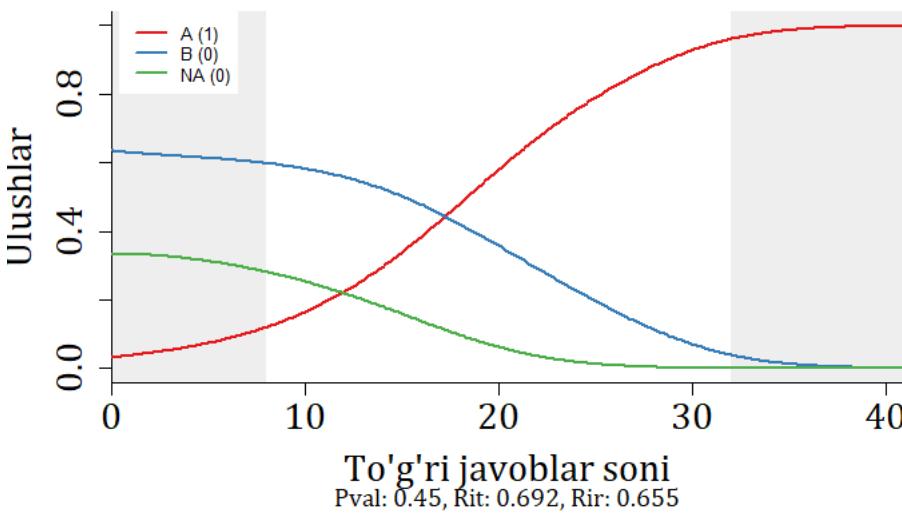
tanlagan, ammo bu distraktorlar o'z funksiyasini bajarmayapti, chunki bu javobni tanlagan test topshiruvchilar soni 5 foiz va undan kam. 1-test topshirig'ida kalit "B" distraktor (75 % - talabgor to'g'ri javob bergan) bo'lganligi uchun "C" va "D" distraktorlatning tanlovdagi ulushi mos ravishda 17 va 2% ni tashkil qiladi.

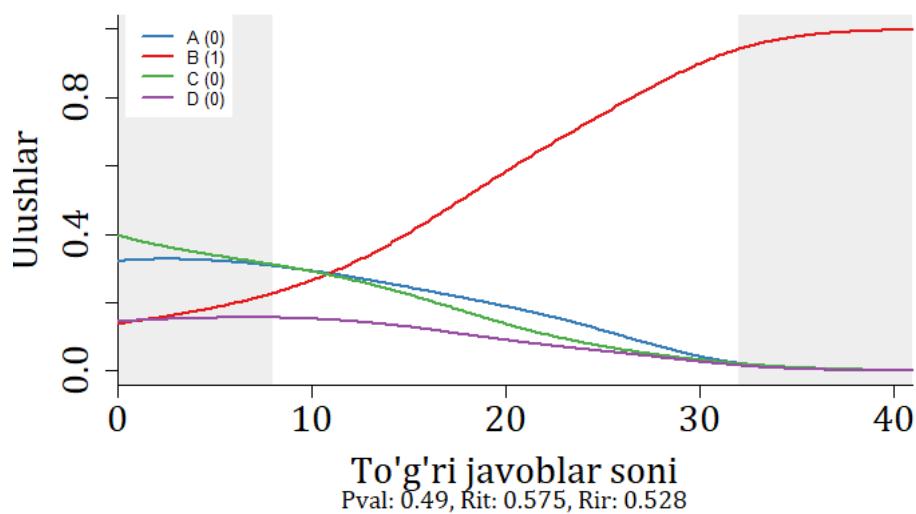
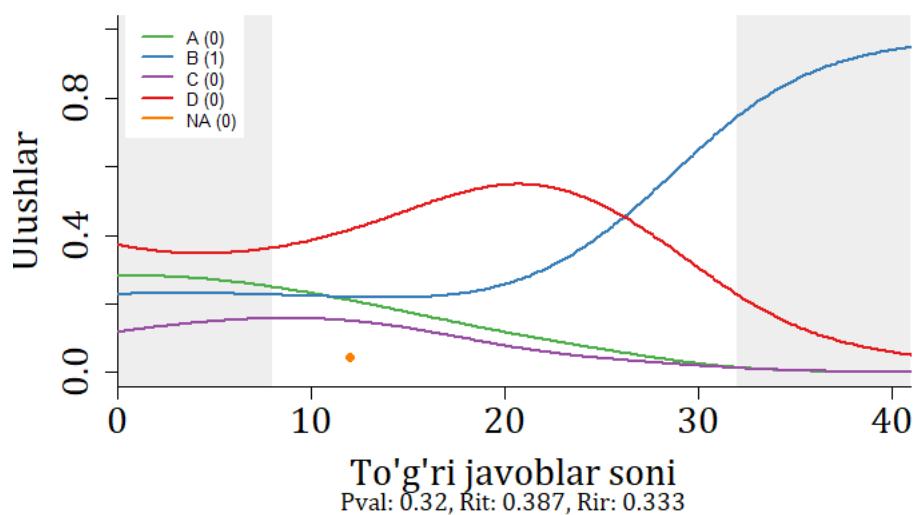
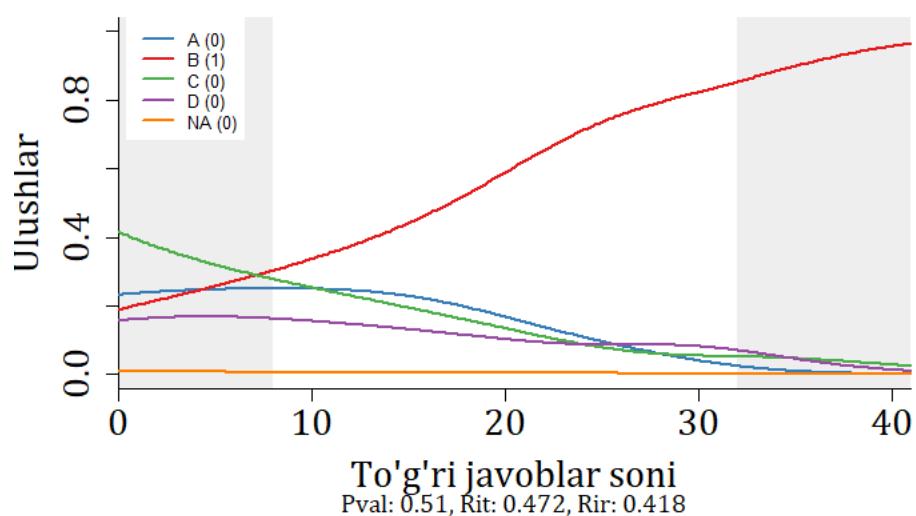
2-jadvalda ochiq qisqa javobli test topshiriqlariga sinaluvchilarning to'g'ri (A) va noto'g'ri javoblari (B) hamda ularning foiz(soni)lardagi natijalari ko'rsatilgan. Jadvaldan ko'rindan 20-test topshirig'ining "A" javobiga 4% ishtirokchilar to'g'ri javob bergan. Bu esa 1-test topshirig'i 1-qiyinlik, 20-test topshirig'i 3-qiyinlik darajasiga teng ekanligini bildiradi [12]. Distraktorlar tahlilining grafik usuli yordamida muqobil javoblar to'g'ri-sida ko'proq ma'lumot olish mumkin. Shuning uchun ushbu maqolada yopiq va ochiq test topshiriqlarining distraktorlari sinaluvchilarning javoblari qanday

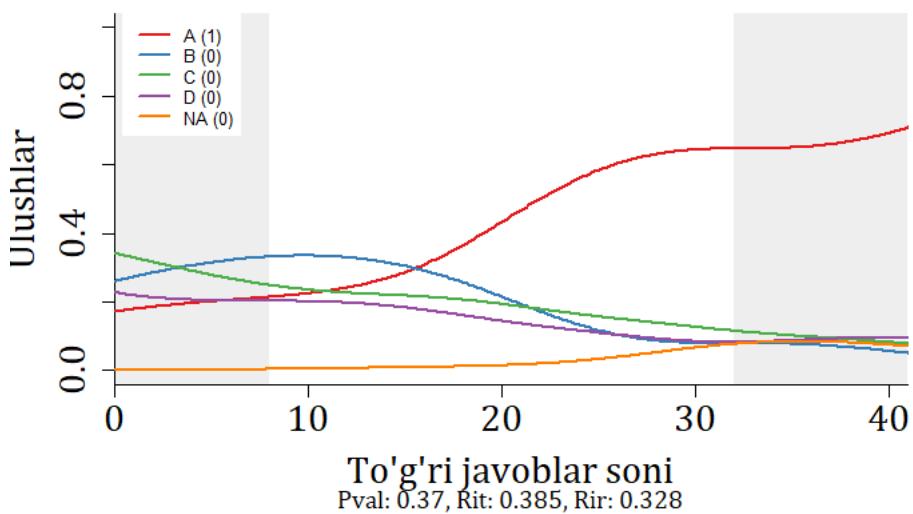
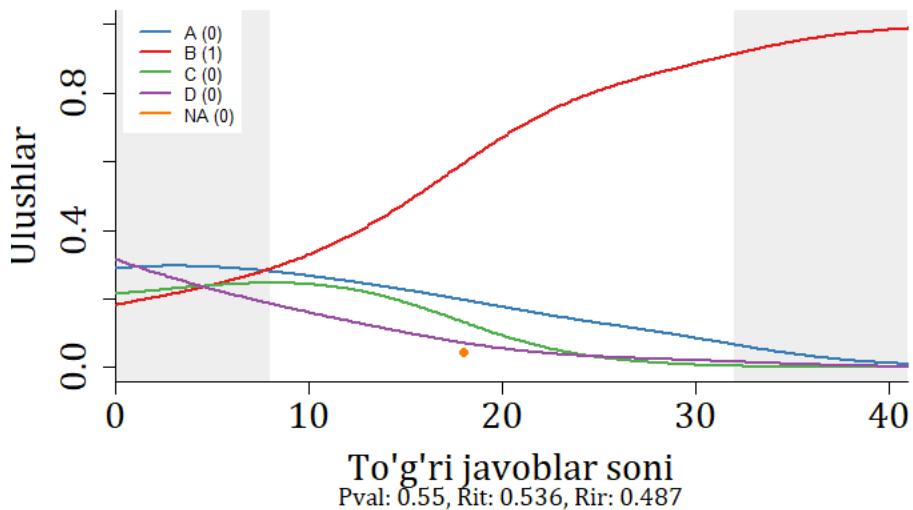
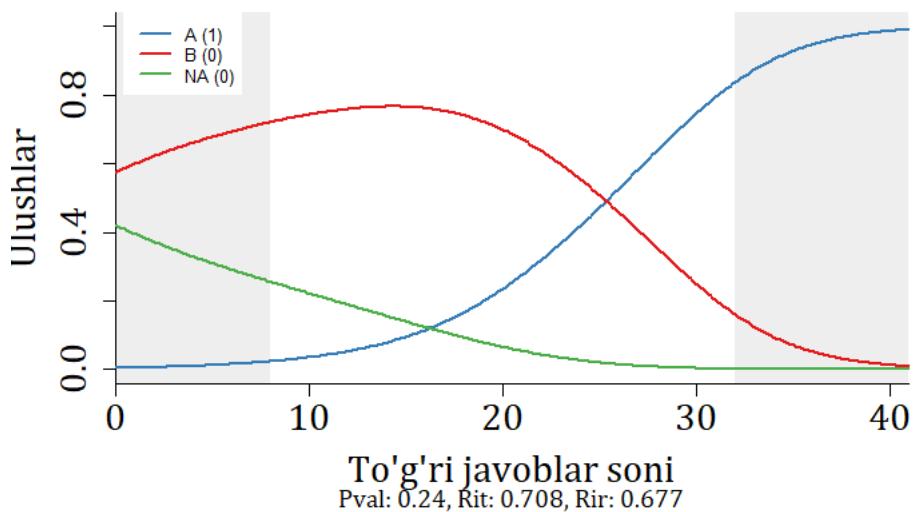
ta'sir qilishini tahlil qilib, o'rganib chiqamiz.

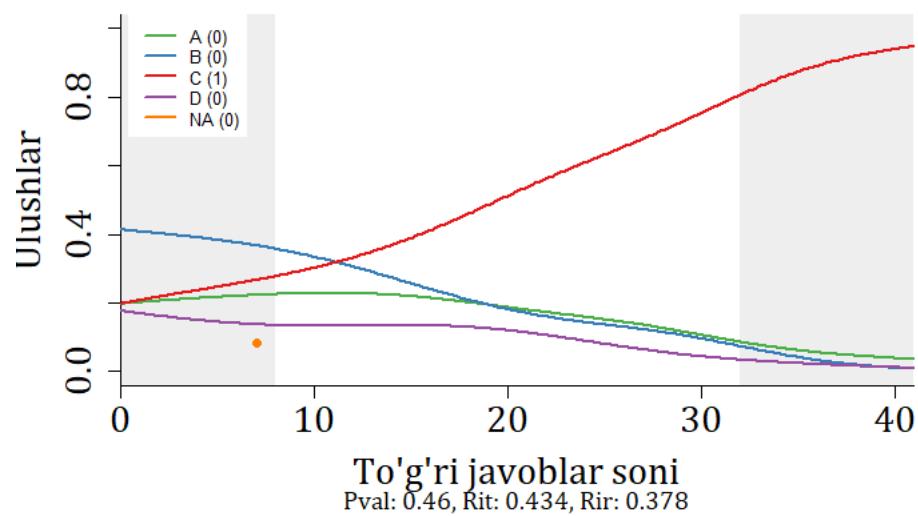
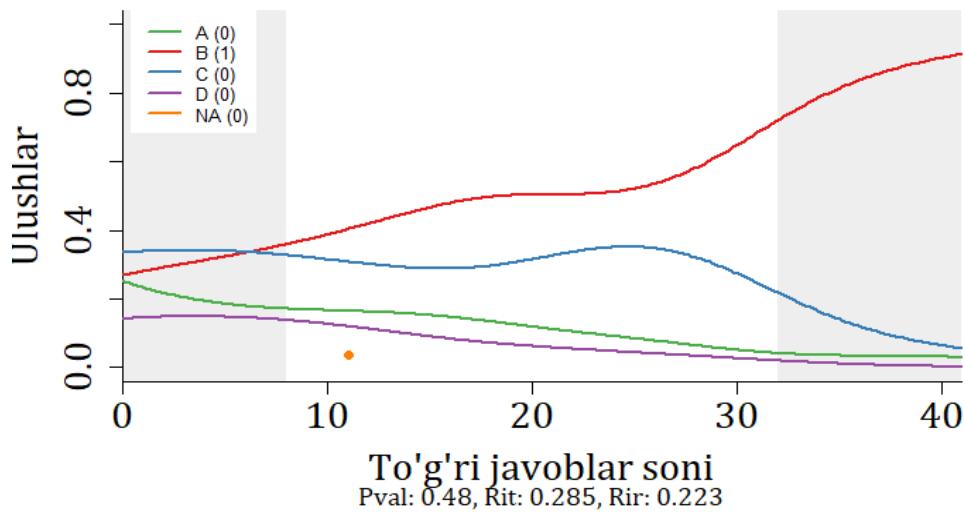
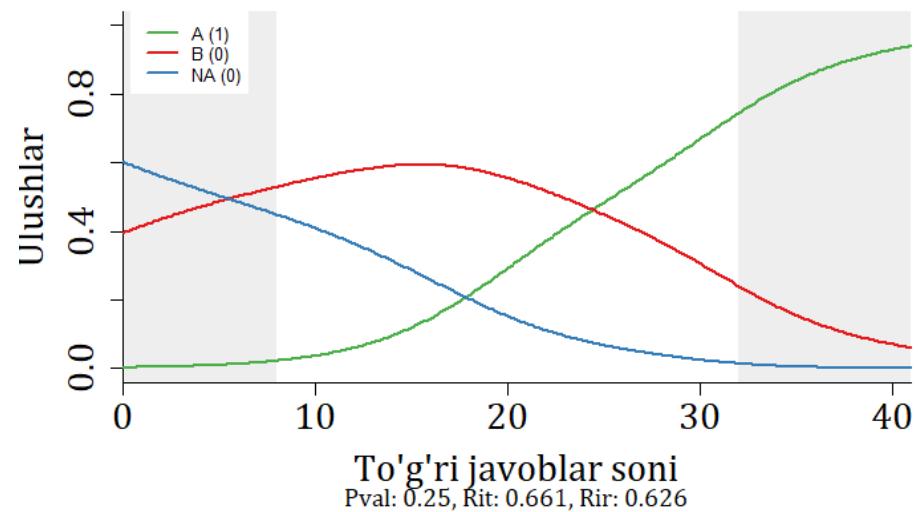
Ma'lum test topshirig'iga javob bermagan sinaluvchilarning javobi "NA" bilan belgilangan. Chizmalarning pastki qismida to'g'ri javoblar ulushi (Pval), element va umumiyl ball korelyatsiyasi (Rit), element chiqarilgandagi umumiyl ball bilan korelyatsiya (Rir) keltirilgan. Rasmning chap burchagida distraktorlarga berilgan javoblarga mos keluvchi chiziqlar mos raqamlar (ranglar) bilan ko'rsatilgan. Qavs ichidagi (1) raqami to'g'ri javobni, (0) esa noto'g'ri javoblarni ko'rsatadi.

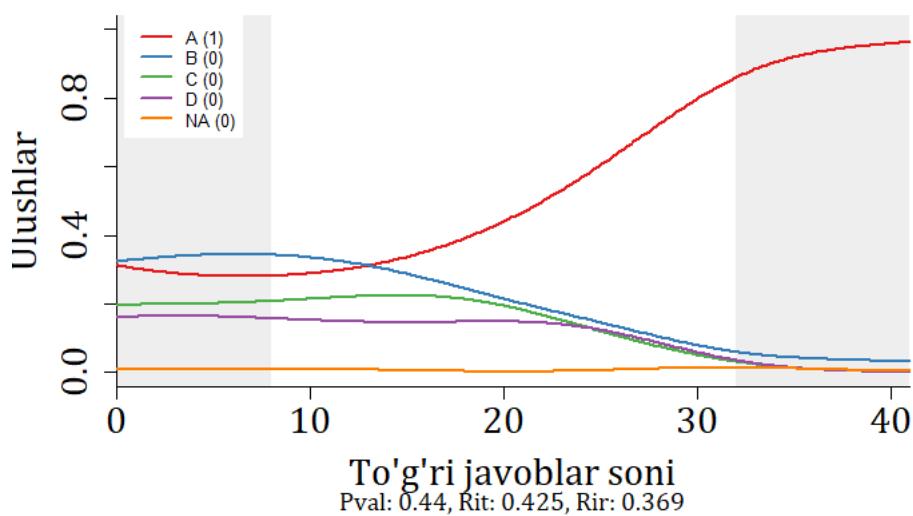
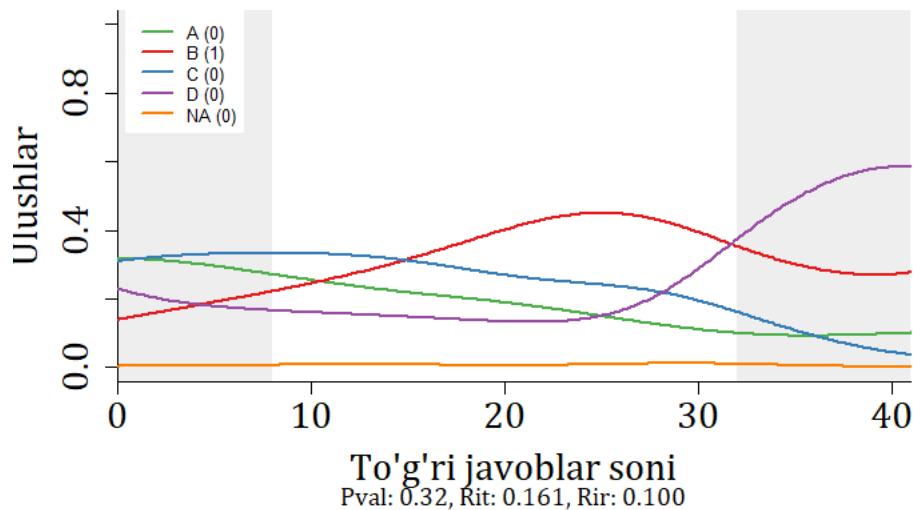
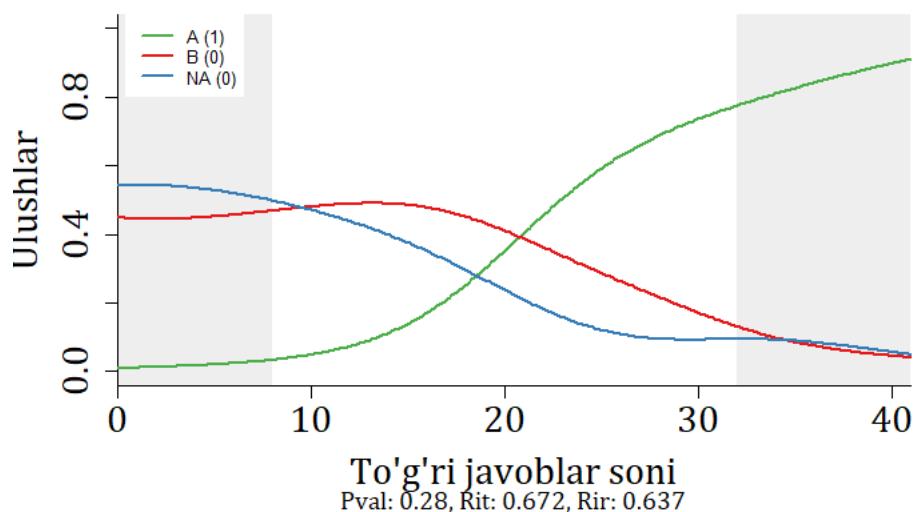


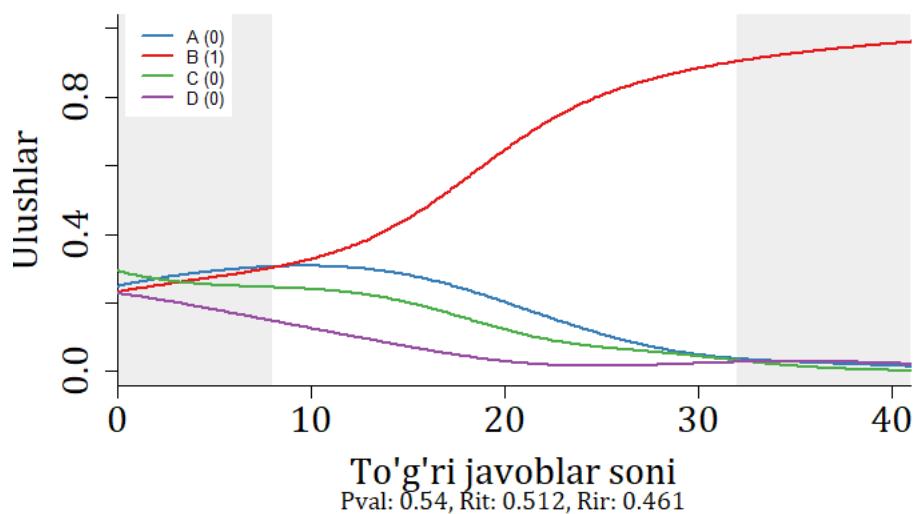
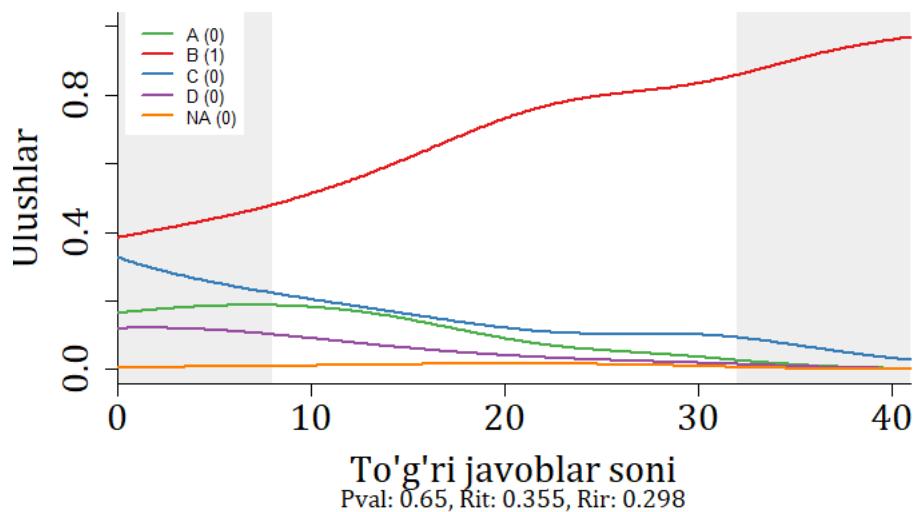
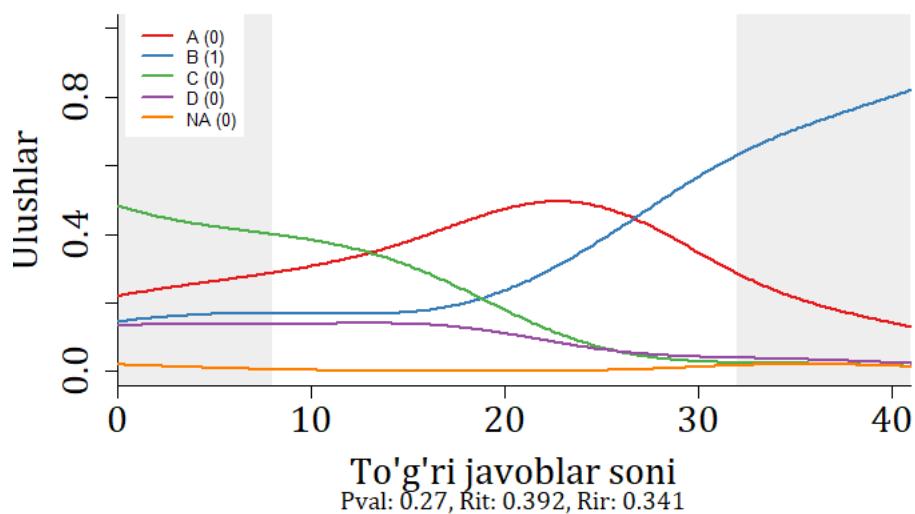
2-test topshirig'i**3-test topshirig'i****4-test topshirig'i**

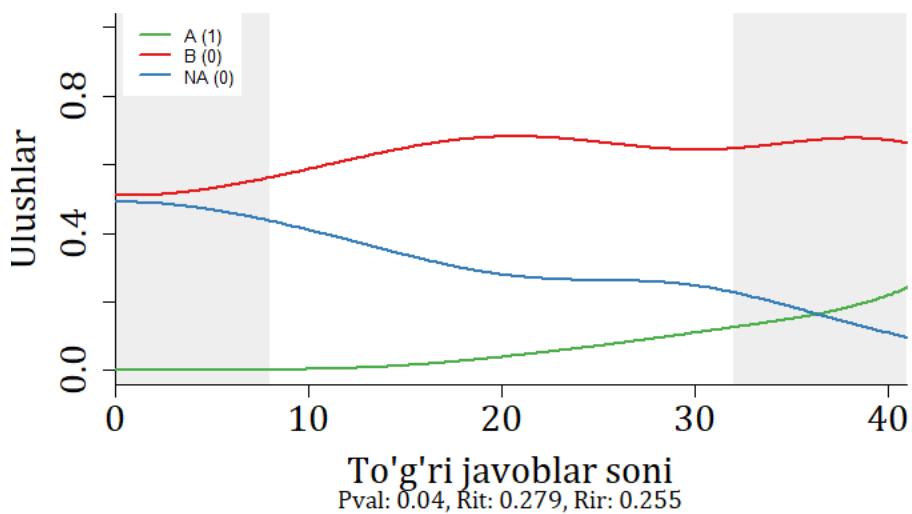
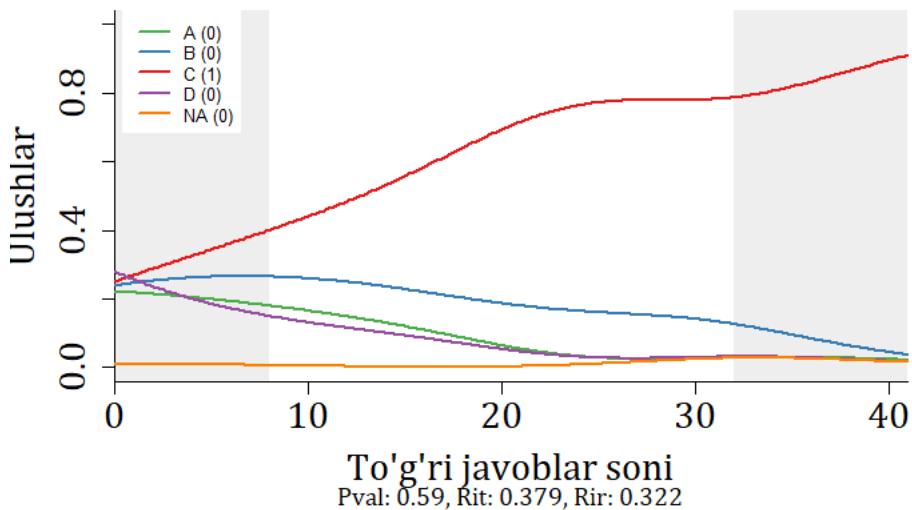
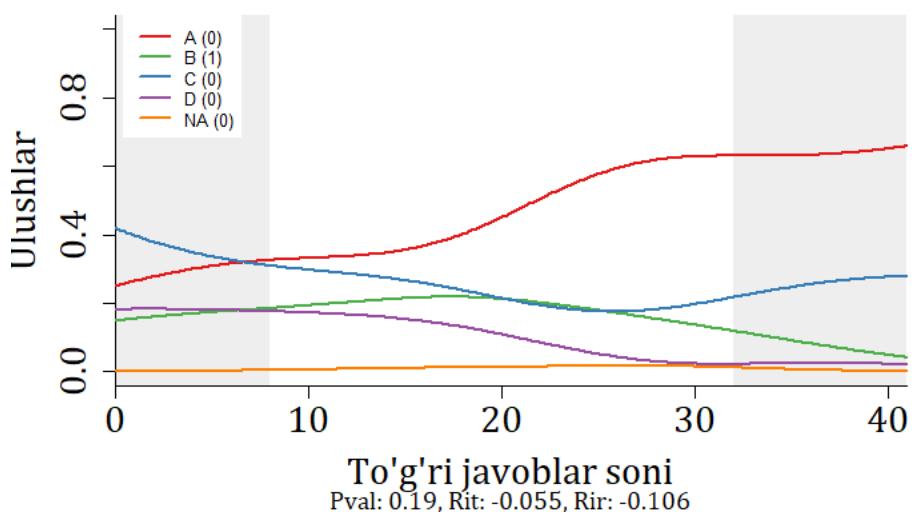
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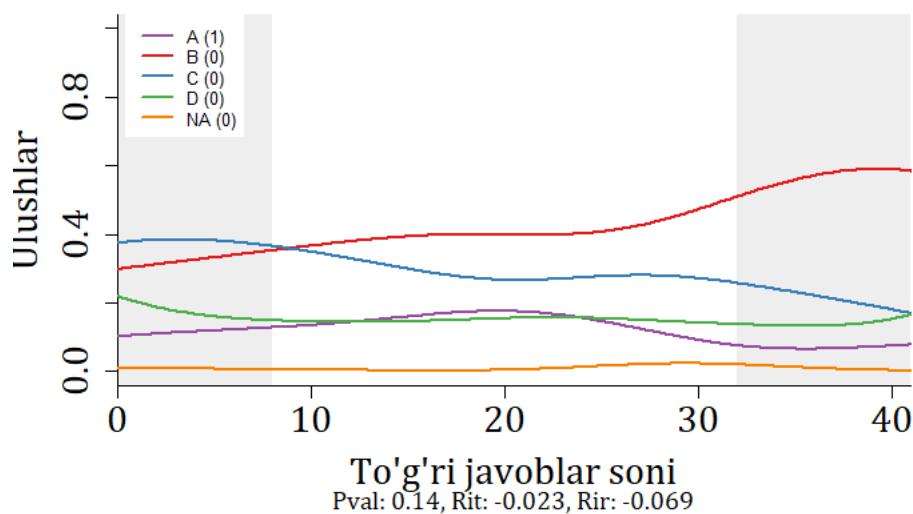
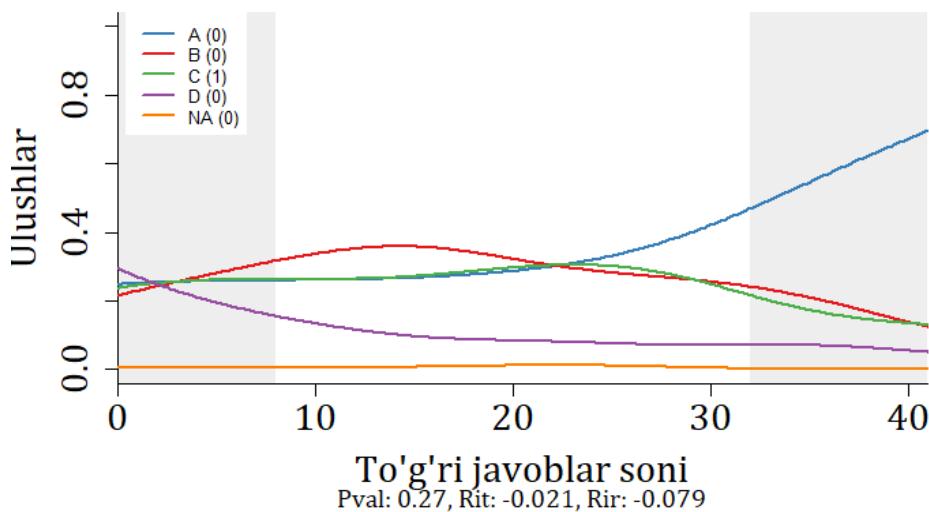
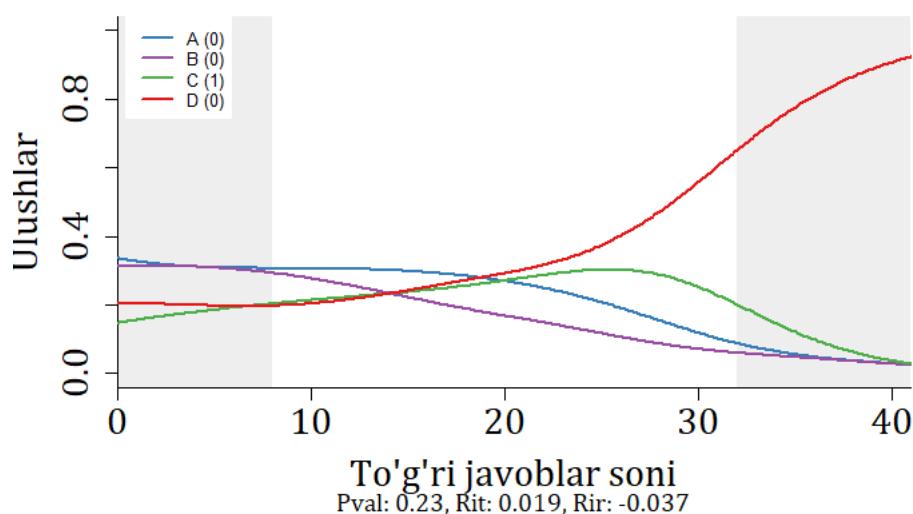
8-test topshirig'i**9-test topshirig'i****10-test topshirig'i**

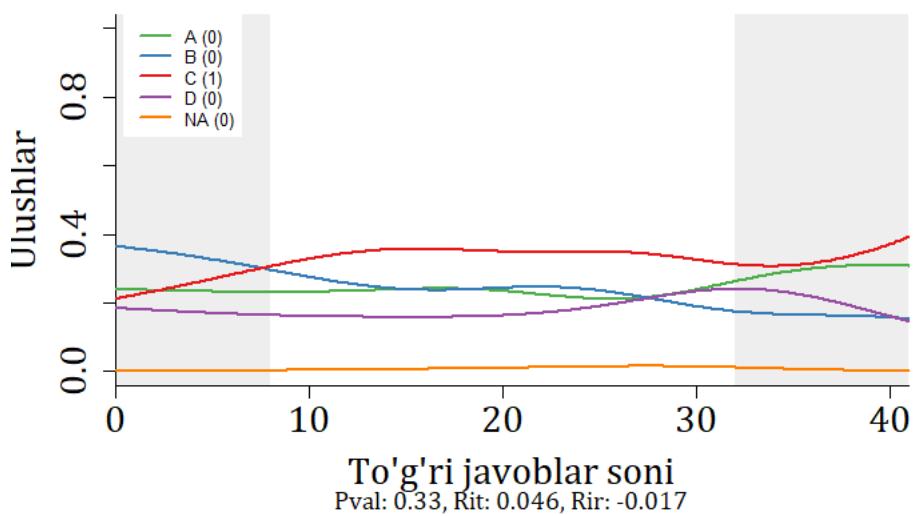
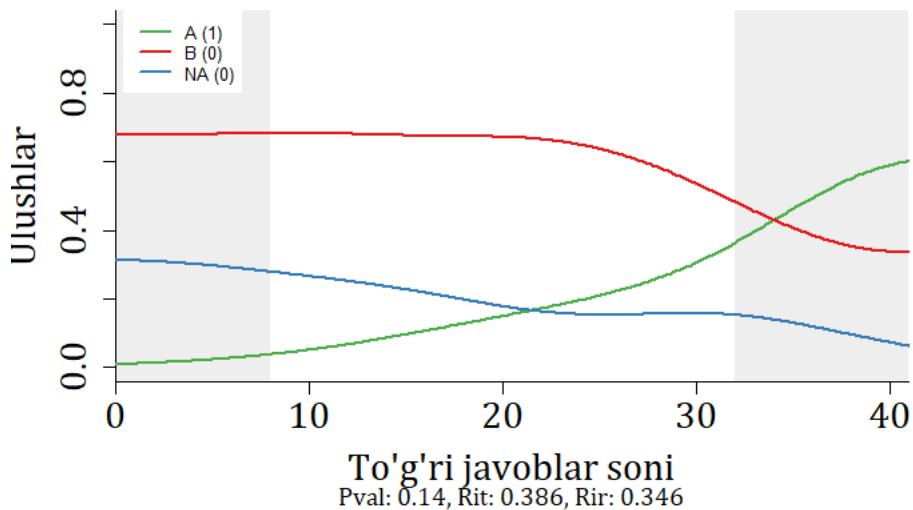
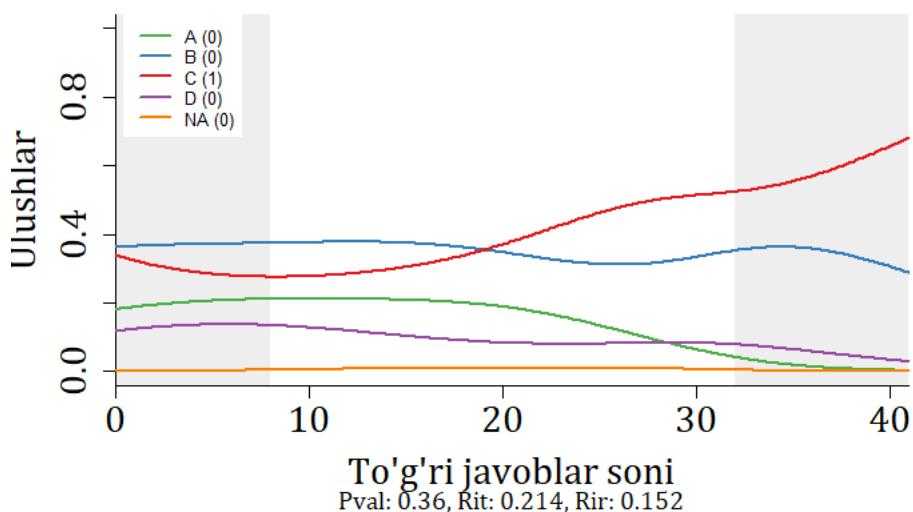
11-test topshirig'i**12-test topshirig'i****13-test topshirig'i**

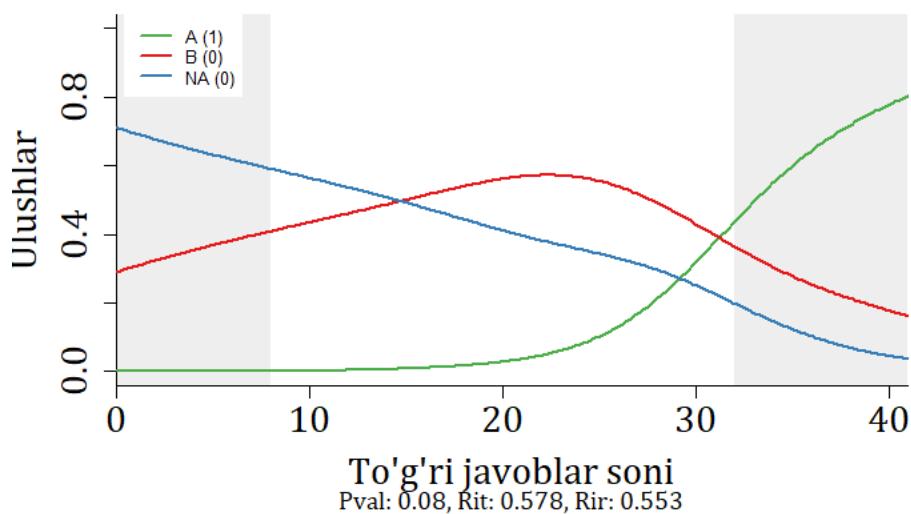
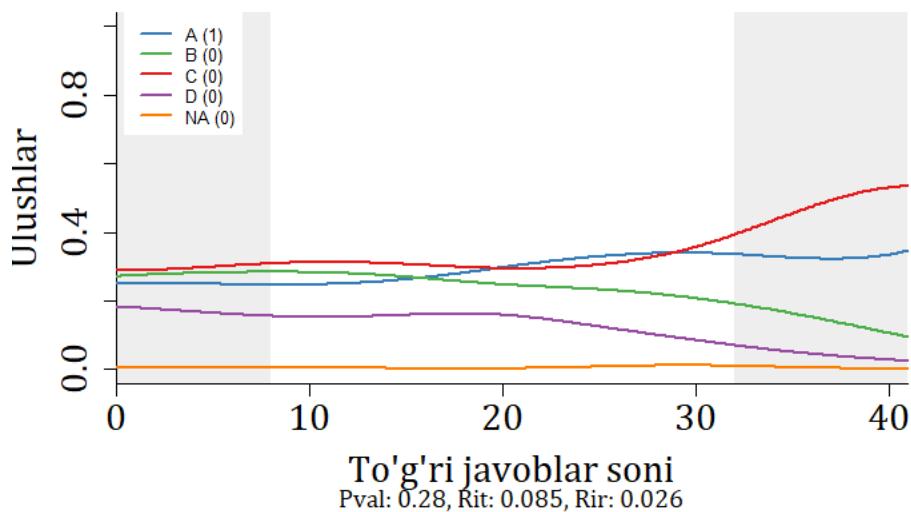
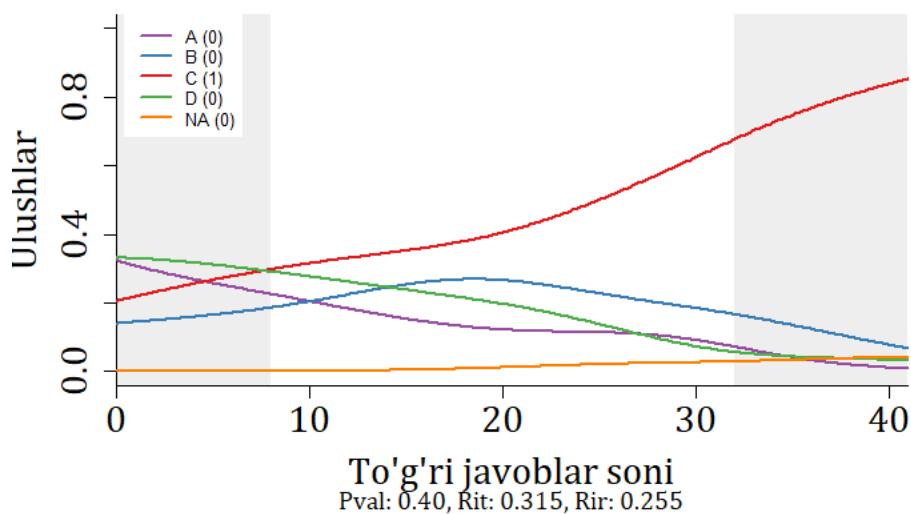
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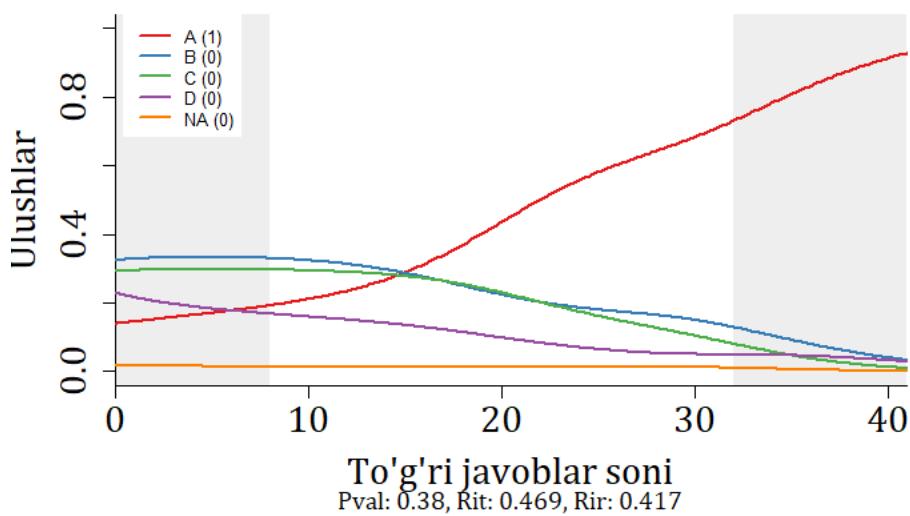
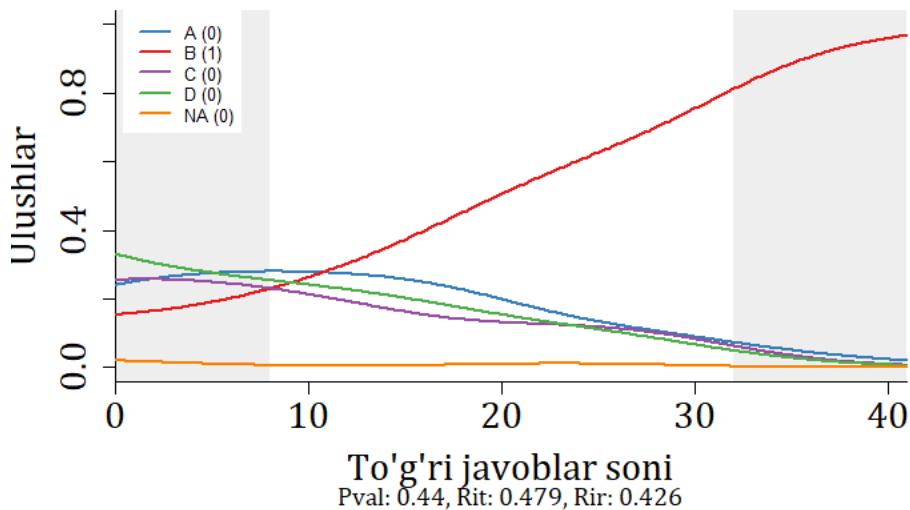
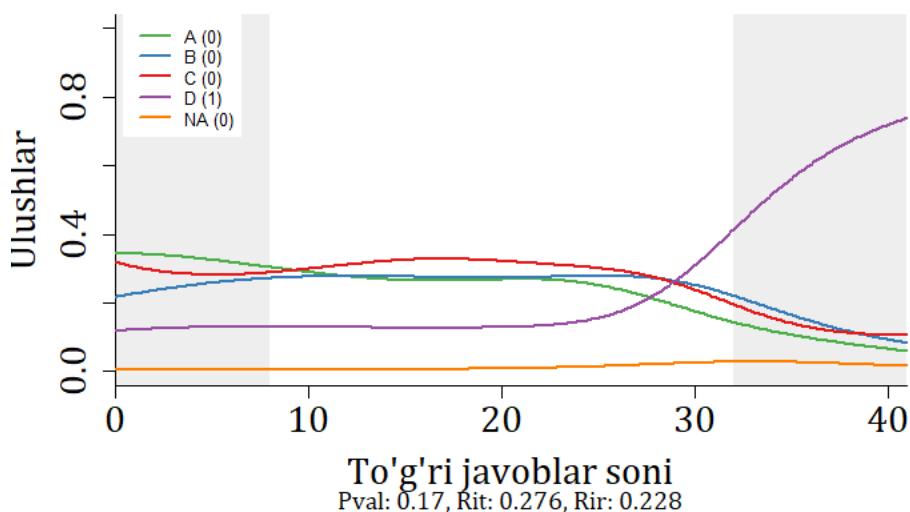
17-test topshirig'i**18-test topshirig'i****19-test topshirig'i**

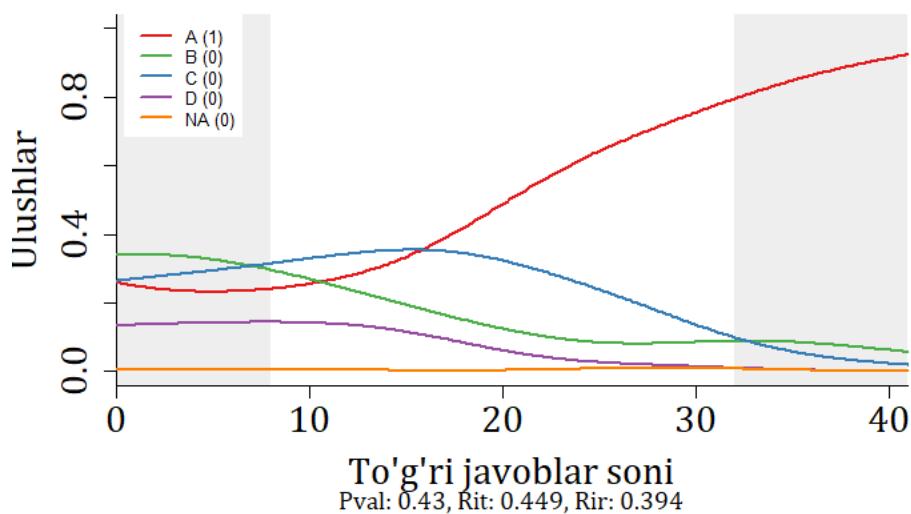
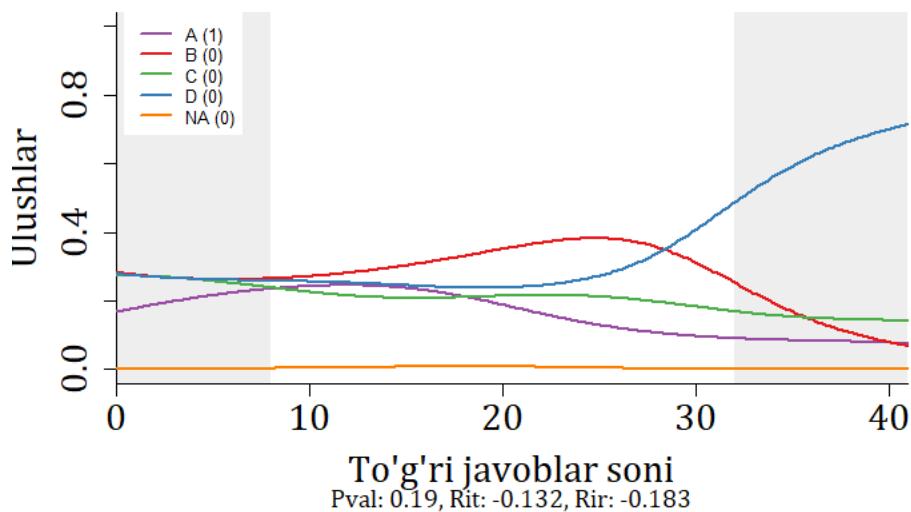
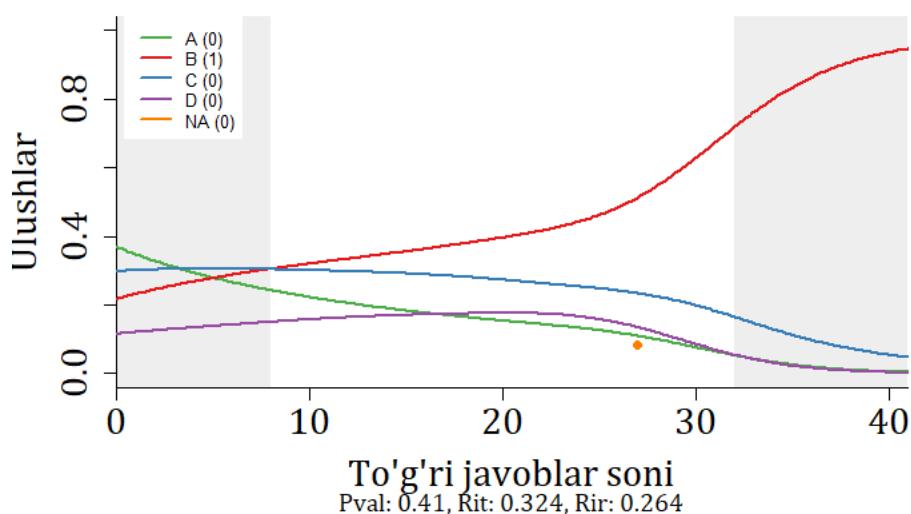
20-test topshirig'i**21-test topshirig'i****22-test topshirig'i**

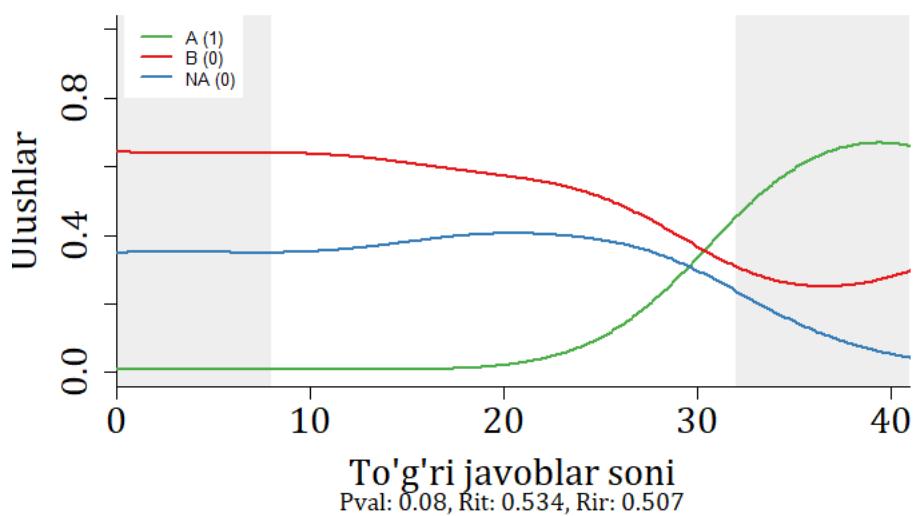
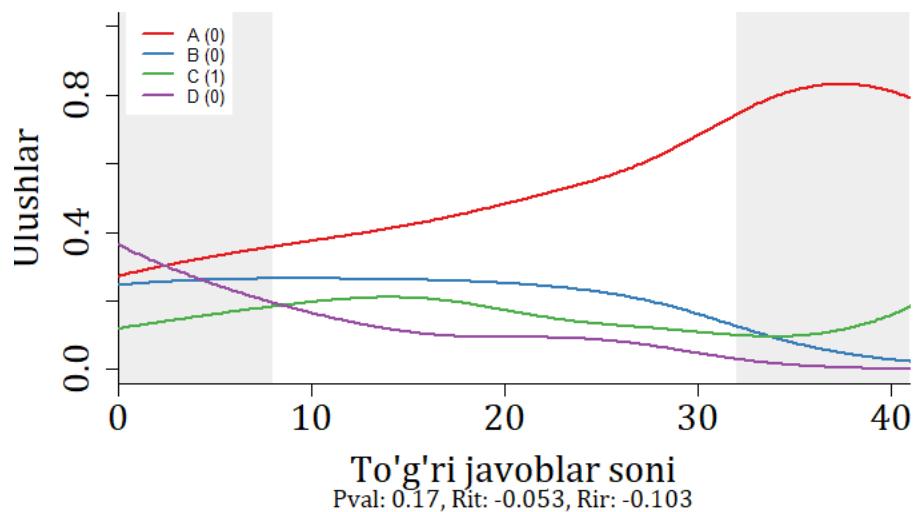
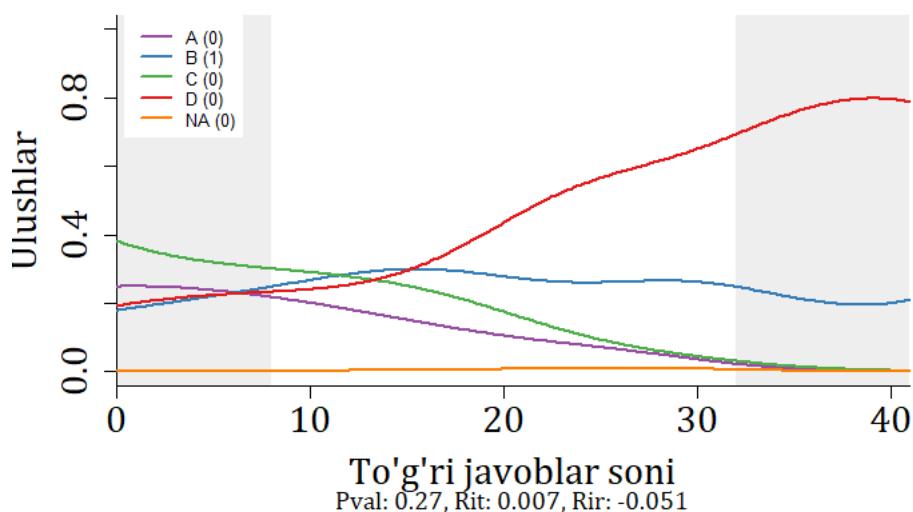
23-test topshirig'i**24-test topshirig'i****25-test topshirig'i**

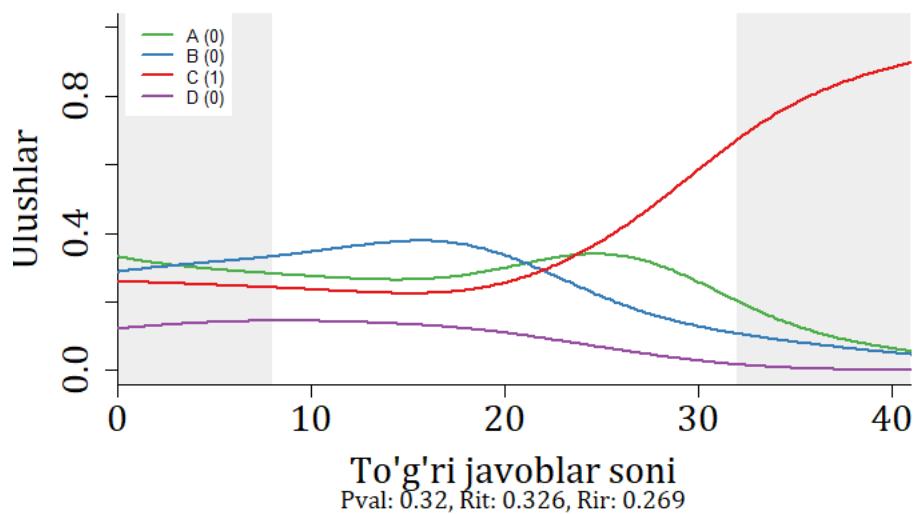
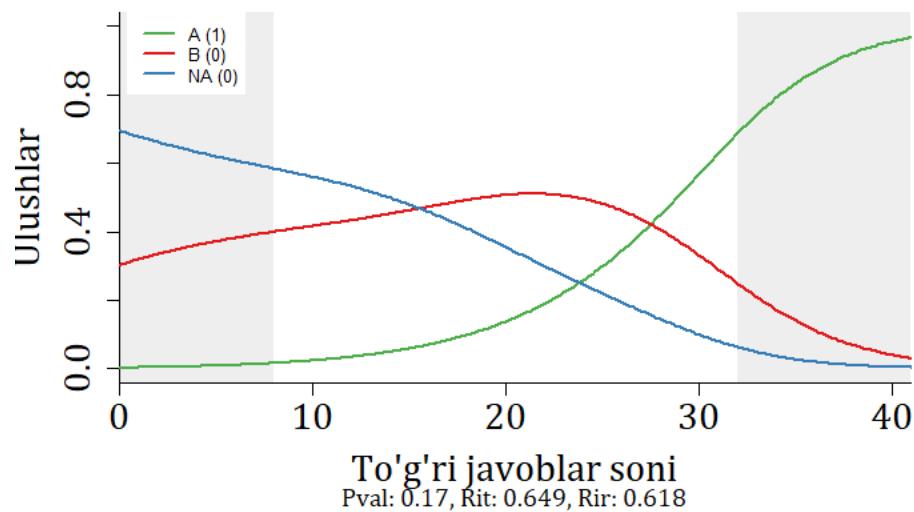
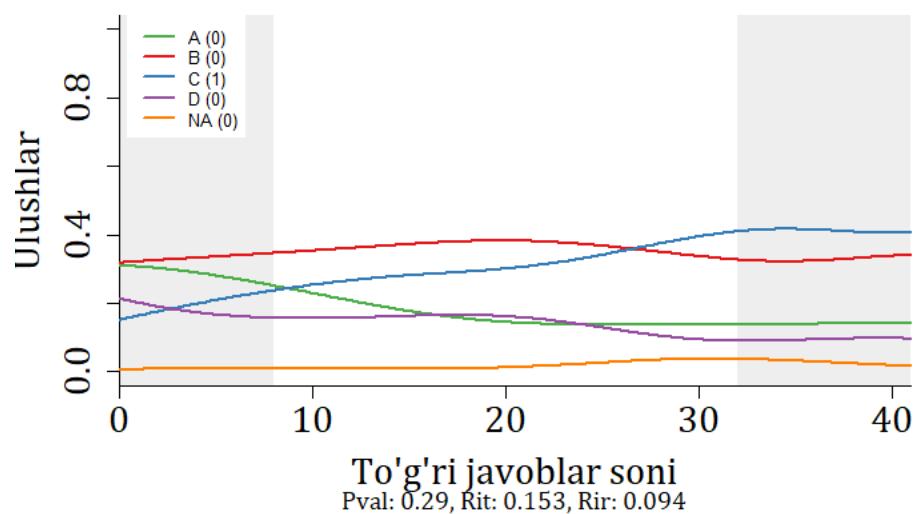
26-test topshirig'i**27-test topshirig'i****28-test topshirig'i**

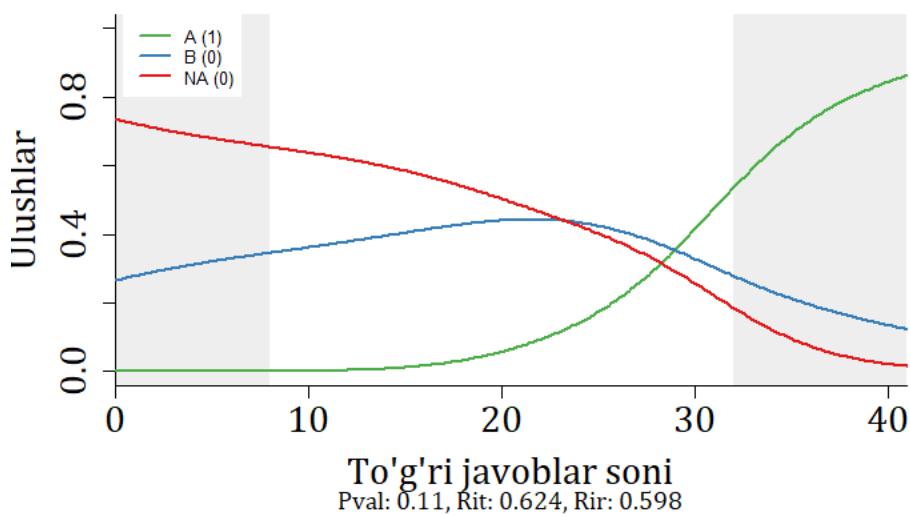
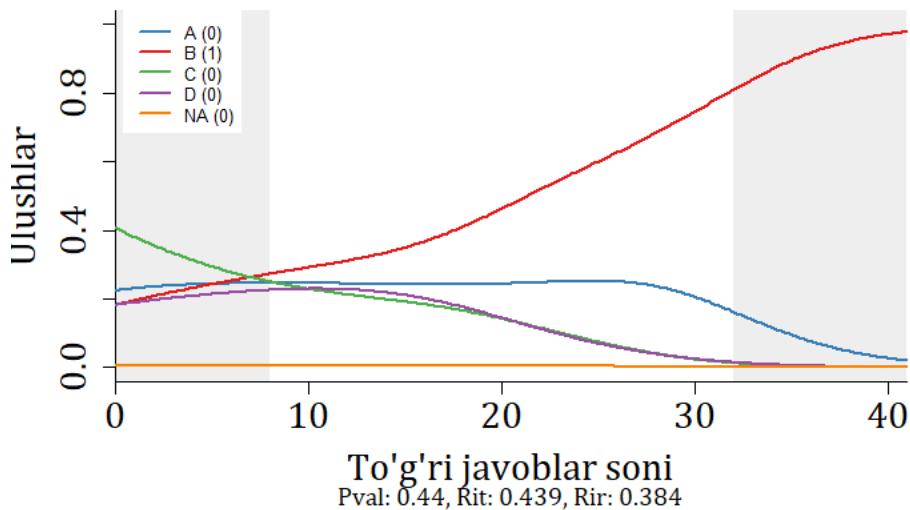
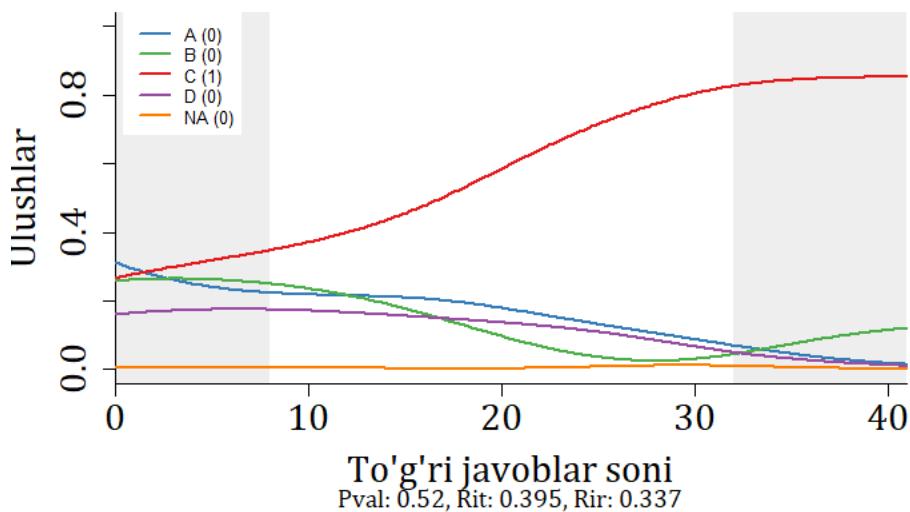
29-test topshirig'i**30-test topshirig'i****31-test topshirig'i**

32-test topshirig'i**33-test topshirig'i****34-test topshirig'i**

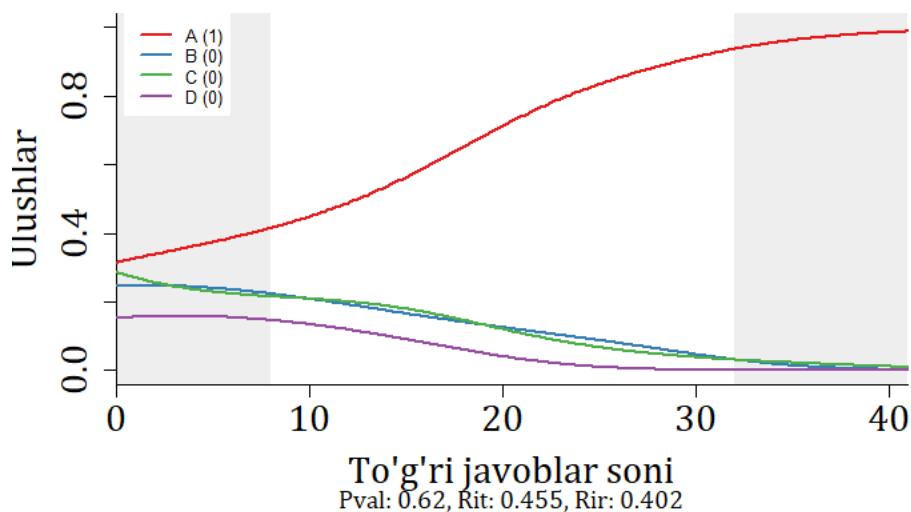
35-test topshirig'i**36-test topshirig'i****37-test topshirig'i**

38-test topshirig'i**39-test topshirig'i****40-test topshirig'i**

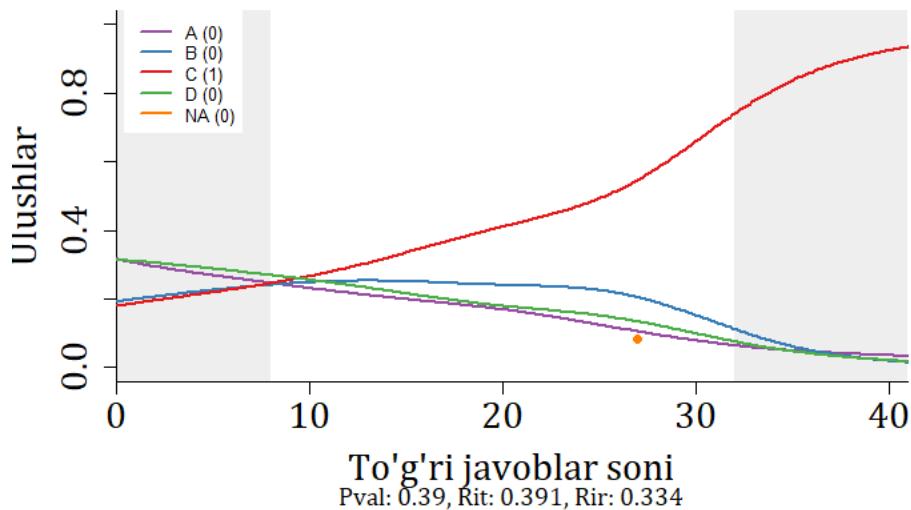
41-test topshirig'i**42-test topshirig'i****43-test topshirig'i**

44-test topshirig'i**45-test topshirig'i****46-test topshirig'i**

47-test topshirig'i



48-test topshirig'i



1-rasm. To'g'ri javoblar sonining test topshirig'i muqobil javoblarini tanlagan sinaluvchilar ulushlariga bog'liqligi

1-rasmida ochiq va yopiq test topshiriqlari to'g'ri javoblar sonining muqobil javoblarini tanlagan sinaluvchilar ulushlariga bog'liqligi keltirilgan. Ushbu natijalarni o'rganish va tahlil qilish orqali tuzilgan test topshiriqlarini ikki guruhga ajratish mumkin.

Birinchi guruhi: Test topshiriqlarining distraktorlari sinaluvchilar-

ning to'g'ri javoblarni tanlashlarida ularga kuchsiz ta'sir qiladi, ya'ni test topshirig'inining to'g'ri javobini tanlaganlar ulushi x o'qidagi o'zgaruvchi (test topshiriqlar soni)ning barcha qiymatlarida monoton bo'lмаган shaklda ortib boradi. Sinaluvchilarning distraktorlarni tanlash ulushi esa to'g'ri javoblar soni ortib borishi bilan kamayib boradi[5]. Bunday yopiq test

topshiriqlariga 1, 2, 3, 5, 6, 7, 8, 9, 11, 12, 14, 17, 18, 19, 21, 31, 32, 33, 35, 37, 41, 45, 46, 47 va 48 – test topshiriqlari kiradi (1-rasm).

Test topshiriqlari qiyinlik darajalari mutaxassis tomonidan shartli ravishda 3 ga bo'linganda yuqorida sanab o'tilgan test topshiriqlari 2-qiyinlik darajasidagi test topshiriqlari ekanligi aniqlandi [12]. Bu test topshiriqlariga to'g'ri javob berganlar ulushi (Pval) 0,27-0,75, test topshiriqlari uchun umumiy ball bilan korrelyatsiyasi (Rit) 0,285-0,575, bu test topshiriqlari umumiy balldan chiqarilgandagi korellyatsiyasi (Rir) 0,223-0,528 oraliqda joylashganligi va umumiy ball bilan korellyatsiyasi yaxshi ekanligini ko'rsatadi (3-jadval).

Test topshiriqlari soni ortib borishi bilan ularga berilayotgan to'g'ri javoblar soni ham ortib borayotganligi sinaluvchilarning tayyorgarlik darjasini oshib borishi bilan sinaluvchilarning test topshiriqlariga javob berish ehtimoli oshib borayotganini bildiradi.

Ikkinci guruh: Test topshiriqlarining distraktorlari sinaluvchilarning to'g'ri javoblarni tanlashida ularga kuchli ta'sir qiladi, ya'ni test topshiriqlarining to'g'ri javobini tanlaganlar ulushi distraktorlarni tanlash ulushidan kichik bo'lishi, x o'qidagi o'zgaruvchi (test topshiriqlar soni)ning qiymatlari ortib borishi bilan to'g'ri javoblarni tanlash ulushi o'zgarmasligi

yoki kamayib borishini anglatadi. Bunday test topshiriqlariga 15, 22, 23, 24, 25, 26, 28, 34, 36, 39, 40 va 43, hamda 20, 27, 38- ochiq test topshiriqlari kiradi (1-rasm).

Sinaluvchilarning distraktorlarni tanlash ulushi aksariyat holatlarda ularni to'g'ri javoblarni tanlash ulushidan katta bo'ladi. Bu test topshiriqlariga to'g'ri javob berganlar ulushi (Pval) 0,04-0,43, test topshiriqlari uchun umumiy ball bilan korrelyatsiyasi (Rit) -0,13-0,534 va bu test topshiriqlari umumiy balldan chiqarilgandagi korellyatsiyasi (Rir) -0,18-0,507 oraliqda joylashganligi aniqlandi (3-jadval).

Statistik tahlillarda aksariyat ikkinchi guruh test topshiriqlarining qiyinlik darjasini mutaxassislar tomonidan belgilangan 3- qiyinlik darajasiga mos kelishi aniqlandi. Distraktorlarning to'g'ri javoblarni tanlash qobiliyatiga kuchli ta'siri natijasida, sinaluvchilar tanlagan javoblari taxminiy bo'lish ehtimoli yuqori ekanligini ko'rsatadi. Ushbu test topshiriqlarining distraktorlari eng ko'p javob bera oladigan sinaluvchilarning ham bu test topshiriqlari javobiga ta'siri juda kuchli bo'ladi [5,12]. Statistik tahlillar ushbu guruhga taalluqli test topshiriqlarining element va umumiy ball korellyatsiyasi (Rit) va Element chiqarilgandagi umumiy ball bilan korellyatsiya (Rir) juda kichik bo'lishini ko'rsatdi.

3-jadval

Test topshiriqlarining to‘g‘ri javoblar ulushi, element va umumiy ball korellyatsiyasi va element chiqarilgandagi umumiy ball bilan korellyatsiyasi.

Nº	To‘g‘ri javoblar ulushi (Pval)	Element va umumiy ball korellyatsiyasi (Rit)	Element chiqarilgandagi umumiy ball bilan korellyatsiya (Rir)
1	0,75	0,404	0,354
2	0,54	0,465	0,411
3	0,67	0,369	0,313
4	0,45	0,692	0,655
5	0,49	0,575	0,528
6	0,32	0,387	0,333
7	0,51	0,472	0,418
8	0,37	0,385	0,328
9	0,55	0,536	0,487
10	0,24	0,708	0,677
11	0,46	0,434	0,378
12	0,48	0,285	0,223
13	0,25	0,661	0,626
14	0,44	0,425	0,365
15	0,32	0,161	0,1
16	0,28	0,672	0,637
17	0,54	0,512	0,461
18	0,65	0,355	0,298
19	0,27	0,392	0,341
20	0,04	0,279	0,255
21	0,59	0,379	0,322
22	0,19	-0,055	-0,106
23	0,14	-0,023	-0,069
24	0,27	-0,021	-0,079
25	0,23	0,019	-0,037
26	0,33	0,046	-0,017
27	0,14	0,386	0,346
28	0,36	0,214	0,152
29	0,08	0,578	0,553
30	0,28	0,085	0,026
31	0,4	0,315	0,255
32	0,38	0,469	0,417
33	0,44	0,479	0,426

34	0,17	0,276	0,228
35	0,43	0,449	0,394
36	0,19	-0,132	-0,183
37	0,41	0,324	0,264
38	0,08	0,534	0,507
39	0,17	-0,053	-0,103
40	0,27	0,007	-0,051
41	0,32	0,326	0,269
42	0,17	0,649	0,618
43	0,29	0,153	0,094
44	0,11	0,624	0,598
45	0,44	0,439	0,384
46	0,52	0,395	0,337
47	0,62	0,455	0,402
48	0,39	0,391	0,334

Xulosa

Distraktorlarni tahlil qilishning grafik usuli ularning sinaluvchilar javoblariga qanchalik ta'sir qilishini, qaysi qobiliyat darajasigacha tanlangan javoblar taxminiy yoki mutanosibligini tahlil qilish imkonini beradi. Bu mutaxassislarga distraktorlar tanlovida hamda test variantida test topshiriqlarining taqsimotini hamda statistik ko'rsatkichlarni yaxshilashga imkon yaratadi. Tadqiq qilingan 38 ta yopiq test topshiriqlarining 114 ta distraktorlaridan 1-test topshirig'ining "A" va "D" distraktori, 3- test

topshirig'ining "A" distraktori o'z funksiyasini bajarmayotganligi ko'rsatildi va ushbu test topshiriqlari uchun taxminiy javob berish ehtimoli qobiliyatlarning qaysi darajalariga to'g'ri kelishi haqida ma'lumotlar berildi. Yuqori korelyyatsiyali test topshiriqlari butun qobiliyatlar oralig'ini quyi korelyyatsiyali test topshiriqlari esa ma'lum oralidagi qobiliyat darajalarini ajratishi yoki umuman ajratmasligi mumkinligi ko'rsatildi.

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ANALYSIS OF DISTRACTORS OF ANSWER MULTIPLE CHOICE TEST TASKS IN PHYSICS

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Abstract. Multiple-choice test tasks are one of the important evaluation tools for determining the level of educational preparation of test-takers. The selection of effective distributors in the formation of test tasks is one of the important conditions for test creation. In this paper 152 distractors of 38 multiple choice questions and answers to the 10 items with short answers on physics test are analysed. The results of the test were analyzed using the dexter package used in the R program. It was found that the distractors of the test items have a strong or weak influence on the test takers in choosing the correct answers.

Keywords: Items, test items, distractors, correlation, distracto plot.