Analysis

Preprocessing

- experiment_results.csv
- task_questionnaire_results.csv
- final_questionnaire_results.csv
- demographic_data_fixed.csv

Dropping Task ID 0 (Training)

Asserting Absolute Distance Values!

Dataset Validation:
dict_items([('pid', True)])

Adding success column based on
`opt_interactions == interactions`
in order to measure effectiveness.

Split by Navigation, Pid, Tid, apply `mean` combine!

Drop jid and pid columns

Computing efficiency task $1000 * mean_success/mean_time_s$

Using normality test: normaltest

Demographics

age

	age
count	50.0
mean	24.1
std	2.90144228737
min	20.0
25%	22.0
50%	24.0
75%	25.0
max	35.0

sex

('f', 29)
('m', 21)

job

('Agrarwissenschaften', 5)
('Agribusiness', 1)
('Betriebswirtschaftslehre', 1)
('Biochemie', 1)
('Biologie', 1)
('Ernährungs- und Verbraucherökonomie', 2)
('Finanzmathematik', 2)
('Informatik / Nachhilfelehrer', 1)
('Mathemathik / Chemie', 1)
('Mathemathik / Deutsch / Psychologie', 1)
('Mathemathik / Geologie', 1)
('Mathemathik / Geschichte', 1)
('Mathemathik / Philosophie', 1)
('Mathemathik / Physik', 1)
('Mathemathik / Sport', 1)
('Mathematik', 4)
('Mathematik / Informatik', 1)
('Mathematik / Spanisch', 1)
('Medizin', 1)
('Musikwissenschaft / Philosophie', 1)
('Physik', 1)
('Politikwissenschaft / Ur- und Frühgeschichte', 1)
('Psychologie', 4)
('Rechtswissenschaften', 1)
('Soziologie / Pädagogik', 1)
('Volkswirtschaftslehre', 3)
('Wirtschaftsinformatik', 6)
('Wirtschaftsingenieur', 2)
('Wirtschaftswissenschaften Profil: Handelslehrer', 1)

smartphone

('None', 1)
('android', 37)
('nodroid', 12)

comments

('Ich zweifle die Aussagekraft der Studie an, da die Navigation nur aus „Wischen nach links“ und „Wischen nach rechts“ besteht.', 1)
('Menü-Steuerung: nur 5/7 Steine da: Menü zum Ausklappen. besser: dauerhaft ausgeklappt - >1 Klick statt 2', 1)

('Samsung', 1)
('man könnte die Bedienung noch vereinfachen, indem man durch wischen von Tür zu Tür kann', 1)
('schön kurz :)', 1)

Efficiency by Tasks

Descriptions (efficiency)

Global Descriptions (efficiency)

burger

	efficiency
count	110.0
mean	0.223055228972
std	0.0500230406763
min	0.068976220448
25%	0.190058286882
50%	0.22691177807
75%	0.25700334919
max	0.336157052575

normaltest
NormaltestResult(statistic=4.771761427618066, pvalue=0.092007911247545662)

swipe

	efficiency
count	140.0
mean	0.215488934466
std	0.100837665235
min	0.0783468808148
25%	0.140770307033
50%	0.186047319425
75%	0.267820085532
max	0.514986095375

normaltest
NormaltestResult(statistic=21.611661929265029, pvalue=2.0280900748269049e-

05)

Repeated measures (efficiency)

burger

KruskalResult(statistic=21.228960676540432, pvalue=0.00028522628404656868)
FriedmanchisquareResult(statistic=30.509090909090901, pvalue=3.8548715779974447e-06)

swipe

KruskalResult(statistic=91.910160660008614, pvalue=5.1718364795390112e-19)
FriedmanchisquareResult(statistic=80.628571428571377, pvalue=1.2818240657137304e-16)

Descriptions per tid (efficiency)

('burger', 1)

	efficiency
count	22.0
mean	0.259627939777
std	0.03615089292
min	0.189458527528
25%	0.242800150862
50%	0.263092621632
75%	0.281021933116
max	0.336157052575

normaltest
NormaltestResult(statistic=0.20268737597716502, pvalue=0.90362241534079546)

('burger', 2)

	efficiency
count	22.0
mean	0.218885902709
std	0.0617582924756
min	0.068976220448
25%	0.175369392634

	efficiency
50%	0.229429832866
75%	0.262567057042
max	0.298650101541

normaltest
NormaltestResult(statistic=2.8677330362290436, pvalue=0.2383854164873315)

('burger', 3)

	efficiency
count	22.0
mean	0.207954767299
std	0.0501700789335
min	0.0904895484572
25%	0.177580422745
50%	0.214082948414
75%	0.246063771629
max	0.280033604032

normaltest
NormaltestResult(statistic=1.7984339571775487, pvalue=0.40688813716037808)

('burger', 4)

	efficiency
count	22.0
mean	0.228578290867
std	0.0445345887587
min	0.113259903163
25%	0.21190614273
50%	0.227615297646
75%	0.251743012241
max	0.304284323272

normaltest
NormaltestResult(statistic=2.3160697541755684, pvalue=0.31410282545206514)

('burger', 5)

	efficiency
count	22.0
mean	0.200229244208
std	0.0336254251422
min	0.144350135689
25%	0.177255912416
50%	0.196225661233
75%	0.22656990971
max	0.255076012652

normaltest
NormaltestResult(statistic=1.5723484852844765, pvalue=0.45558442091815343)

('swipe', 1)

	efficiency
count	28.0
mean	0.376411637958
std	0.0826782359999
min	0.124738828079
25%	0.339208375025
50%	0.385810331212
75%	0.43554876804
max	0.514986095375

normaltest
NormaltestResult(statistic=9.9372068077013189, pvalue=0.0069528515829475517)

('swipe', 2)

	efficiency
count	28.0
mean	0.235764444338
std	0.0515833509387
min	0.0783468808148
25%	0.214528622096
50%	0.250787488437
75%	0.270937446389
max	0.305866519851

normaltest
NormaltestResult(statistic=11.365760575131674, pvalue=0.0034037405594077226)

('swipe', 3)

	efficiency
count	28.0
mean	0.176438327988
std	0.0368031666814
min	0.106547333653
25%	0.149048762852
50%	0.183800941036
75%	0.207357536463
max	0.233165454206

normaltest
NormaltestResult(statistic=2.0647128368782415, pvalue=0.35616669318396116)

('swipe', 4)

	efficiency
count	28.0
mean	0.158462999373
std	0.0321520787395
min	0.0888474267564
25%	0.137780626155
50%	0.155438077528
75%	0.183456377089
max	0.223483663344

normaltest
NormaltestResult(statistic=0.12655594049035332, pvalue=0.93868251161307126)

('swipe', 5)

	efficiency
count	28.0
mean	0.130367262672
std	0.0267090785385
min	0.0821186614658

	efficiency
25%	0.120638250545
50%	0.128225214081
75%	0.143514673291
max	0.182588372772

normaltest
NormaltestResult(statistic=0.20145824064936479, pvalue=0.9041779231387197)

Cross-compare Tests per tid (efficiency)

('burger', 1) vs ('burger', 2)

{'n2': 22, 'test_result': Ttest_relResult(statistic=3.1400467644045085, pvalue=0.0049443978028402098), 'N': 44, 'n1': 22, 'df': 21, 'effect_size': 0.66946021956115787}

('burger', 1) vs ('burger', 3)

{'n2': 22, 'test_result': Ttest_relResult(statistic=3.9836168083266799, pvalue=0.00067564806607191632), 'N': 44, 'n1': 22, 'df': 21, 'effect_size': 0.8493099572214986}

('burger', 1) vs ('burger', 4)

{'n2': 22, 'test_result': Ttest_relResult(statistic=2.8165527849774352, pvalue=0.010338413955597564), 'N': 44, 'n1': 22, 'df': 21, 'effect_size': 0.60049107141057878}

('burger', 1) vs ('burger', 5)

{'n2': 22, 'test_result': Ttest_relResult(statistic=8.8261650322279657, pvalue=1.6451903254595333e-08), 'N': 44, 'n1': 22, 'df': 21, 'effect_size': 1.8817447075438416}

('burger', 1) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=58.0, pvalue=5.4061503445428946e-07), 'effect_size': 0.81168831168831168, 'N': 50}

('burger', 1) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=233.0, pvalue=0.072691640416537293), 'effect_size': 0.24350649350649356, 'N': 50}

('burger', 1) vs ('swipe', 3)

{'n2': 28, 'test_result': Ttest_indResult(statistic=8.0131642746175658, pvalue=3.0036765567743509e-10), 'N': 50, 'n1': 22, 'df': 45.605549072886376, 'effect_size': 2.2829620500029861}

('burger', 1) vs ('swipe', 4)

{'n2': 28, 'test_result': Ttest_indResult(statistic=10.307733474302083, pvalue=3.9626211595999131e-13), 'N': 50, 'n1': 22, 'df': 42.458884481600464, 'effect_size': 2.9366881218094303}

('burger', 1) vs ('swipe', 5)

{'n2': 28, 'test_result': Ttest_indResult(statistic=14.030061269834485, pvalue=1.6751765716561837e-16), 'N': 50, 'n1': 22, 'df': 37.509707823002977, 'effect_size': 3.9971846751859452}

('burger', 2) vs ('burger', 3)

{'n2': 22, 'test_result': Ttest_relResult(statistic=1.17541673163024, pvalue=0.25298310480066288), 'N': 44, 'n1': 22, 'df': 21, 'effect_size': 0.25059968919993747}

('burger', 2) vs ('burger', 4)

{'n2': 22, 'test_result': Ttest_relResult(statistic=-0.91478090125993261, pvalue=0.37069158497461707), 'N': 44, 'n1': 22, 'df': 21, 'effect_size': -0.19503194345704855}

('burger', 2) vs ('burger', 5)

{'n2': 22, 'test_result': Ttest_relResult(statistic=1.7093607431380531, pvalue=0.10212210775377208), 'N': 44, 'n1': 22, 'df': 21, 'effect_size': 0.36443693494719148}

('burger', 2) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=42.0, pvalue=1.0574010189647895e-07), 'effect_size': 0.86363636363636365, 'N': 50}

('burger', 2) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=263.0, pvalue=0.19222905550361363), 'effect_size': 0.14610389610389607, 'N': 50}

('burger', 2) vs ('swipe', 3)

{'n2': 28, 'test_result': Ttest_indResult(statistic=2.8505540361974759, pvalue=0.0075330728311379285), 'N': 50, 'n1': 22, 'df': 32.392545034300269, 'effect_size': 0.8121269529860301}

('burger', 2) vs ('swipe', 4)

{'n2': 28, 'test_result': Ttest_indResult(statistic=4.1667258070177873, pvalue=0.00024295893165475588), 'N': 50, 'n1': 22, 'df': 29.84388793928602, 'effect_size': 1.1871061872924931}

('burger', 2) vs ('swipe', 5)

{'n2': 28, 'test_result': Ttest_indResult(statistic=6.2773612390822446, pvalue=9.9419198495425322e-07), 'N': 50, 'n1': 22, 'df': 27.169372064223619, 'effect_size': 1.7884292636279995}

('burger', 3) vs ('burger', 4)

{'n2': 22, 'test_result': Ttest_relResult(statistic=-2.4460095385965119, pvalue=0.023338332791632995), 'N': 44, 'n1': 22, 'df': 21, 'effect_size': -0.5214909858414325}

('burger', 3) vs ('burger', 5)

{'n2': 22, 'test_result': Ttest_relResult(statistic=0.78458522971067601, pvalue=0.4414581754358432), 'N': 44, 'n1': 22, 'df': 21, 'effect_size': 0.16727413301634728}

('burger', 3) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=32.0, pvalue=3.634468651668778e-08), 'effect_size': 0.89610389610389607, 'N': 50}

('burger', 3) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=197.0, pvalue=0.015401027053631673), 'effect_size': 0.36038961038961037, 'N': 50}

('burger', 3) vs ('swipe', 3)

{'n2': 28, 'test_result': Ttest_indResult(statistic=2.470189187096973, pvalue=0.018195085242505033), 'N': 50, 'n1': 22, 'df': 37.322733521049877, 'effect_size': 0.7037604593148387 7}

('burger', 3) vs ('swipe', 4)

{'n2': 28, 'test_result': Ttest_indResult(statistic=4.0231808100500288, pvalue=0.00030313523132898115), 'N': 50, 'n1': 22, 'df': 33.987304407263395, 'effect_size': 1.1462100107866362}

('burger', 3) vs ('swipe', 5)

{'n2': 28, 'test_result': Ttest_indResult(statistic=6.5599551896199069, pvalue=2.8434885910251012e-07), 'N': 50, 'n1': 22, 'df': 30.228298418120758, 'effect_size': 1.8689406873961953}

('burger', 4) vs ('burger', 5)

{'n2': 22, 'test_result': Ttest_relResult(statistic=2.7959221711584767, pvalue=0.010828183767257568), 'N': 44, 'n1': 22, 'df': 21, 'effect_size': 0.59609260976552092}

('burger', 4) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=40.0, pvalue=8.565787191672169e-08), 'effect_size': 0.87012987012987009, 'N': 50}

('burger', 4) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=262.0, pvalue=0.18693288210180464), 'effect_size': 0.14935064935064934, 'N': 50}

('burger', 4) vs ('swipe', 3)

{'n2': 28, 'test_result': Ttest_indResult(statistic=4.430023567415585, pvalue=6.9900388209403688e-05), 'N': 50, 'n1': 22, 'df': 40.510976522970402, 'effect_size': 1.2621200986811547}

('burger', 4) vs ('swipe', 4)

{'n2': 28, 'test_result': Ttest_indResult(statistic=6.2199825165556213, pvalue=3.1960770384704573e-07), 'N': 50, 'n1': 22, 'df': 36.907897952812725, 'effect_size': 1.7720819828888703}

('burger', 4) vs ('swipe', 5)

{'n2': 28, 'test_result': Ttest_indResult(statistic=9.1332813540710109, pvalue=1.7051757569924315e-10), 'N': 50, 'n1': 22, 'df': 32.52632637459962, 'effect_size': 2.6020850201949877}

('burger', 5) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=30.0, pvalue=2.9224626895523775e-08), 'effect_size': 0.90259740259740262, 'N': 50}

('burger', 5) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=149.0, pvalue=0.0009750243017655867), 'effect_size': 0.51623376623376616, 'N': 50}

('burger', 5) vs ('swipe', 3)

{'n2': 28, 'test_result': Ttest_indResult(statistic=2.3818550602659152, pvalue=0.021339025726255848), 'N': 50, 'n1': 22, 'df': 46.852508622129029, 'effect_size': 0.67859393927802347}

('burger', 5) vs ('swipe', 4)

{'n2': 28, 'test_result': Ttest_indResult(statistic=4.4443766050942699, pvalue=5.8417405173783915e-05), 'N': 50, 'n1': 22, 'df': 44.248400605855807, 'effect_size': 1.2662092998006793}

('burger', 5) vs ('swipe', 5)

{'n2': 28, 'test_result': Ttest_indResult(statistic=7.9681513334901224, pvalue=9.6399894615656076e-10), 'N': 50, 'n1': 22, 'df': 39.442494949086644, 'effect_size': 2.2701377982054178}

('swipe', 1) vs ('swipe', 2)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=3.0, pvalue=5.2564133258508337e-06), 'effect_size': 0.0019126554032515141, 'N': 56}

('swipe', 1) vs ('swipe', 3)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=0.0, pvalue=3.7896194415808708e-06), 'effect_size': 0.0, 'N': 56}

('swipe', 1) vs ('swipe', 4)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=1.0, pvalue=4.2284088472460966e-06), 'effect_size': 0.00063755180108383803, 'N': 56}

('swipe', 1) vs ('swipe', 5)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=0.0, pvalue=3.7896194415808708e-06), 'effect_size': 0.0, 'N': 56}

('swipe', 2) vs ('swipe', 3)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=30.0, pvalue=8.1666493089205386e-05), 'effect_size': 0.01912655403251514, 'N': 56}

('swipe', 2) vs ('swipe', 4)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=16.0, pvalue=2.0602777134809463e-05), 'effect_size': 0.010200828817341408, 'N': 56}

('swipe', 2) vs ('swipe', 5)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=5.0, pvalue=6.5213205645443688e-06), 'effect_size': 0.0031877590054191903, 'N': 56}

('swipe', 3) vs ('swipe', 4)

{'n2': 28, 'test_result': Ttest_relResult(statistic=2.0977040344080686, pvalue=0.04542748458455511), 'N': 56, 'n1': 28, 'df': 27, 'effect_size': 0.39642879994718772}

('swipe', 3) vs ('swipe', 5)

{'n2': 28, 'test_result': Ttest_relResult(statistic=5.0744024279604449, pvalue=2.493775482784069e-05), 'N': 56, 'n1': 28, 'df': 27, 'effect_size': 0.9589719197604063}

('swipe', 4) vs ('swipe', 5)

{'n2': 28, 'test_result': Ttest_relResult(statistic=4.1324585768793005, pvalue=0.00031147549191696151), 'N': 56, 'n1': 28, 'df': 27, 'effect_size': 0.78096126412132294}

Global Burger vs Swipe per tid Tests (efficiency)

burger vs swipe 1

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=202.0, pvalue=7.1491176304337561e-13), 'effect_size': 0.86883116883116884, 'N': 138}

burger vs swipe 2

{‘n1’: 110, ‘n2’: 28, ‘test_result’: MannwhitneyuResult(statistic=1254.0, pvalue=0.06532753407855946), ‘effect_size’: 0.18571428571428572, ‘N’: 138}

burger vs swipe 3

{‘n2’: 28, ‘test_result’: Ttest_indResult(statistic=5.5276510400502614, pvalue=9.0622300016681276e-07), ‘N’: 138, ‘n1’: 110, ‘df’: 55.333617103825162, ‘effect_size’: 1.1700510299170281}

burger vs swipe 4

{‘n2’: 28, ‘test_result’: Ttest_indResult(statistic=8.3619818317844903, pvalue=7.0554228434676112e-12), ‘N’: 138, ‘n1’: 110, ‘df’: 64.460648478482284, ‘effect_size’: 1.7700005632660121}

burger vs swipe 5

{‘n2’: 28, ‘test_result’: Ttest_indResult(statistic=13.346985621733216, pvalue=3.9194832679581521e-22), ‘N’: 138, ‘n1’: 110, ‘df’: 80.786408371513843, ‘effect_size’: 2.8251881603681546}

Global Burger vs Global Swipe Test (efficiency)

burger vs swipe

{‘n1’: 110, ‘n2’: 140, ‘test_result’: MannwhitneyuResult(statistic=5992.0, pvalue=0.0013125763723938479), ‘effect_size’: 0.2218181818181818, ‘N’: 250}

Effectiveness by Tasks

Descriptions (effectiveness)

Global Descriptions (effectiveness)

burger

	effectiveness
count	110.0
mean	0.978181818182
std	0.0626360071457
min	0.8

	effectiveness
25%	1.0
50%	1.0
75%	1.0
max	1.0

normaltest
NormaltestResult(statistic=68.459419887611048, pvalue=1.3621528840605701e-15)

swipe

	effectiveness
count	140.0
mean	0.934285714286
std	0.105783427849
min	0.6
25%	0.8
50%	1.0
75%	1.0
max	1.0

normaltest
NormaltestResult(statistic=30.683850175565183, pvalue=2.173134430069827e-07)

Repeated measures (effectiveness)

burger

KruskalResult(statistic=4.2636054421768179, pvalue=0.37150463698880992)
FriedmanchisquareResult(statistic=5.1111111111109082, pvalue=0.276085623834601)

swipe

KruskalResult(statistic=8.4325646925437621, pvalue=0.076957851331098878)
FriedmanchisquareResult(statistic=8.7192429022081477, pvalue=0.068513251264267688)

Descriptions per tid (effectiveness)

('burger', 1)

	effectiveness
count	22.0
mean	0.990909090909
std	0.0426401432711
min	0.8
25%	1.0
50%	1.0
75%	1.0
max	1.0

normaltest
NormaltestResult(statistic=55.867295667147665, pvalue=7.3887485384486275e-13)

('burger', 2)

	effectiveness
count	22.0
mean	0.963636363636
std	0.0789542033952
min	0.8
25%	1.0
50%	1.0
75%	1.0
max	1.0

normaltest
NormaltestResult(statistic=11.761207015205065, pvalue=0.0027930991097338811)

('burger', 3)

	effectiveness
count	22.0
mean	0.963636363636
std	0.0789542033952
min	0.8
25%	1.0
50%	1.0
75%	1.0

	effectiveness
max	1.0

normaltest
NormaltestResult(statistic=11.761207015205118, pvalue=0.002793099109733807)

('burger', 4)

	effectiveness
count	22.0
mean	0.981818181818
std	0.0588489886336
min	0.8
25%	1.0
50%	1.0
75%	1.0
max	1.0

normaltest
NormaltestResult(statistic=32.977747192506733, pvalue=6.9019718607633975e-08)

('burger', 5)

	effectiveness
count	22.0
mean	0.990909090909
std	0.0426401432711
min	0.8
25%	1.0
50%	1.0
75%	1.0
max	1.0

normaltest
NormaltestResult(statistic=55.867295667147665, pvalue=7.3887485384486275e-13)

('swipe', 1)

	effectiveness
count	28.0
mean	0.978571428571
std	0.0629940788349
min	0.8
25%	1.0
50%	1.0
75%	1.0
max	1.0

normaltest
NormaltestResult(statistic=30.230322102932696, pvalue=2.7262706131404123e-07)

('swipe', 2)

	effectiveness
count	28.0
mean	0.935714285714
std	0.0951189731211
min	0.8
25%	0.8
50%	1.0
75%	1.0
max	1.0

normaltest
NormaltestResult(statistic=13.850854641882318, pvalue=0.0009824831927910632)

('swipe', 3)

	effectiveness
count	28.0
mean	0.892857142857
std	0.138586973437
min	0.6
25%	0.8
50%	1.0
75%	1.0
max	1.0

normaltest
NormaltestResult(statistic=4.3703066280619502, pvalue=0.11246049056138591)

('swipe', 4)

	effectiveness
count	28.0
mean	0.942857142857
std	0.0920087412456
min	0.8
25%	0.8
50%	1.0
75%	1.0
max	1.0

normaltest
NormaltestResult(statistic=8.1469969468004297, pvalue=0.017017748104058518)

('swipe', 5)

	effectiveness
count	28.0
mean	0.921428571429
std	0.113389341903
min	0.6
25%	0.8
50%	1.0
75%	1.0
max	1.0

normaltest
NormaltestResult(statistic=6.1681726236411034, pvalue=0.045771835985766236)

Cross-compare Tests per tid (effectiveness)

('burger', 1) vs ('burger', 2)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=3.0, pvalue=0.17971249487899976), 'effect_size': 0.0030975735673722249, 'N': 44}

('burger', 1) vs ('burger', 3)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=3.0, pvalue=0.17971249487899976), 'effect_size': 0.0030975735673722249, 'N': 44}

('burger', 1) vs ('burger', 4)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=2.0, pvalue=0.5637028616507731), 'effect_size': 0.0020650490449148169, 'N': 44}

('burger', 1) vs ('burger', 5)

{'n1': 22, 'n2': 22, 'test_result': '=== All pairs were equal ===', 'effect_size': '=== All pairs were equal ===', 'N': 44}

('burger', 1) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=289.0, pvalue=0.22085511431458626), 'effect_size': 0.061688311688311681, 'N': 50}

('burger', 1) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=223.0, pvalue=0.0085809342731982628), 'effect_size': 0.27597402597402598, 'N': 50}

('burger', 1) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=188.5, pvalue=0.0011982167922993706), 'effect_size': 0.38798701298701299, 'N': 50}

('burger', 1) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=234.0, pvalue=0.015452252565939647), 'effect_size': 0.24025974025974028, 'N': 50}

('burger', 1) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=211.5, pvalue=0.0045566881958452573), 'effect_size': 0.31331168831168832, 'N': 50}

('burger', 2) vs ('burger', 3)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=5.0, pvalue=1.0), 'effect_size': 0.0051626226122870418, 'N': 44}

('burger', 2) vs ('burger', 4)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=0.0, pvalue=0.15729920705028502), 'effect_size': 0.0, 'N': 44}

('burger', 2) vs ('burger', 5)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=3.0, pvalue=0.17971249487899976), 'effect_size': 0.0030975735673722249, 'N': 44}

('burger', 2) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=285.0, pvalue=0.23222527082050248), 'effect_size': 0.074675324675324672, 'N': 50}

('burger', 2) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=265.0, pvalue=0.13717816505985114), 'effect_size': 0.13961038961038963, 'N': 50}

('burger', 2) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=226.0, pvalue=0.025658789178159933), 'effect_size': 0.26623376623376627, 'N': 50}

('burger', 2) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=276.0, pvalue=0.20268150101021792), 'effect_size': 0.10389610389610393, 'N': 50}

('burger', 2) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=252.0, pvalue=0.082343202897603662), 'effect_size': 0.18181818181818177, 'N': 50}

('burger', 3) vs ('burger', 4)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=2.5, pvalue=0.31731050786291415), 'effect_size': 0.0025813113061435209, 'N': 44}

('burger', 3) vs ('burger', 5)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=3.0, pvalue=0.17971249487899976), 'effect_size': 0.0030975735673722249, 'N': 44}

('burger', 3) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=285.0, pvalue=0.23222527082050248), 'effect_size': 0.074675324675324672, 'N': 50}

('burger', 3) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=265.0, pvalue=0.13717816505985114), 'effect_size': 0.13961038961038963, 'N': 50}

('burger', 3) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=226.0, pvalue=0.025658789178159933), 'effect_size': 0.26623376623376627, 'N': 50}

('burger', 3) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=276.0, pvalue=0.20268150101021792), 'effect_size': 0.10389610389610393, 'N': 50}

('burger', 3) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=252.0, pvalue=0.082343202897603662), 'effect_size': 0.18181818181818177, 'N': 50}

('burger', 4) vs ('burger', 5)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=2.0, pvalue=0.5637028616507731), 'effect_size': 0.0020650490449148169, 'N': 44}

('burger', 4) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=303.0, pvalue=0.43281068947535356), 'effect_size': 0.016233766233766267, 'N': 50}

('burger', 4) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=237.0, pvalue=0.027429809187369383), 'effect_size': 0.23051948051948057, 'N': 50}

('burger', 4) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=201.0, pvalue=0.0040041913682163349), 'effect_size': 0.34740259740259738, 'N': 50}

('burger', 4) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=248.0, pvalue=0.046661220530755103), 'effect_size': 0.19480519480519476, 'N': 50}

('burger', 4) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=225.0, pvalue=0.014890923602395365), 'effect_size': 0.26948051948051943, 'N': 50}

('burger', 5) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=289.0, pvalue=0.22085511431458626), 'effect_size': 0.061688311688311681, 'N': 50}

('burger', 5) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=223.0, pvalue=0.0085809342731982628), 'effect_size': 0.27597402597402598, 'N': 50}

('burger', 5) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=188.5, pvalue=0.0011982167922993706), 'effect_size': 0.38798701298701299, 'N': 50}

('burger', 5) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=234.0, pvalue=0.015452252565939647), 'effect_size': 0.24025974025974028, 'N': 50}

('burger', 5) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=211.5, pvalue=0.0045566881958452573), 'effect_size': 0.31331168831168832, 'N': 50}

('swipe', 1) vs ('swipe', 2)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=4.5, pvalue=0.033894853524689246), 'effect_size': 0.0028689831048772712, 'N': 56}

('swipe', 1) vs ('swipe', 3)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=5.0, pvalue=0.0050991474349813982), 'effect_size': 0.0031877590054191903, 'N': 56}

('swipe', 1) vs ('swipe', 4)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=18.0, pvalue=0.13166801602281422), 'effect_size': 0.011475932419509085, 'N': 56}

('swipe', 1) vs ('swipe', 5)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=11.0, pvalue=0.032509444645719511), 'effect_size': 0.0070130698119222189, 'N': 56}

('swipe', 2) vs ('swipe', 3)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=30.0, pvalue=0.13458487139107694), 'effect_size': 0.01912655403251514, 'N': 56}

('swipe', 2) vs ('swipe', 4)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=42.0, pvalue=0.7815112949987133), 'effect_size': 0.026777175645521199, 'N': 56}

('swipe', 2) vs ('swipe', 5)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=52.5, pvalue=0.63735188823393707), 'effect_size': 0.033471469556901501, 'N': 56}

('swipe', 3) vs ('swipe', 4)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=35.0, pvalue=0.068594778422537167), 'effect_size': 0.022314313037934332, 'N': 56}

('swipe', 3) vs ('swipe', 5)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=58.0, pvalue=0.35511621808512916), 'effect_size': 0.036978004462862604, 'N': 56}

('swipe', 4) vs ('swipe', 5)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=30.0, pvalue=0.43857802608099983), 'effect_size': 0.01912655403251514, 'N': 56}

Global Burger vs Swipe per tid Tests (effectiveness)

burger vs swipe 1

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=1537.0, pvalue=0.49020683242704011), 'effect_size': 0.0019480519480519209, 'N': 138}

burger vs swipe 2

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=1213.0, pvalue=0.0027313254754476467), 'effect_size': 0.21233766233766238, 'N': 138}

burger vs swipe 3

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=1030.0, pvalue=2.0615949541882224e-05), 'effect_size': 0.33116883116883122, 'N': 138}

burger vs swipe 4

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=1268.0, pvalue=0.0092023144768541426), 'effect_size': 0.17662337662337657, 'N': 138}

burger vs swipe 5

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=1152.0, pvalue=0.00061159598135044442), 'effect_size': 0.25194805194805192, 'N': 138}

Global Burger vs Global Swipe Test (effectiveness)

burger vs swipe

{'n1': 110, 'n2': 140, 'test_result': MannwhitneyuResult(statistic=6206.0, pvalue=0.00011462735661581992), 'effect_size': 0.19402597402597399, 'N': 250}

Task Questionnaires

Task Question 0

Descriptions (result)

Global Descriptions (result)

burger

	result
count	110.0
mean	6.90909090909
std	0.395976427467
min	4.0
25%	7.0
50%	7.0
75%	7.0
max	7.0

normaltest
NormaltestResult(statistic=153.41323829366706, pvalue=4.861145039338043e-34)

swipe

	result
count	140.0
mean	6.83571428571
std	0.458504203722
min	5.0
25%	7.0
50%	7.0
75%	7.0
max	7.0

normaltest
NormaltestResult(statistic=101.53235210749389, pvalue=8.9645784582099588e-23)

Repeated measures (result)

burger

KruskalResult(statistic=2.4526192106750853, pvalue=0.65313967433502973)
FriedmanchisquareResult(statistic=3.3103448275862144, pvalue=0.50729488262873967)

swipe

KruskalResult(statistic=1.7694225721785437, pvalue=0.77807166799688021)
FriedmanchisquareResult(statistic=5.0958904109588801, pvalue=0.27759929640181424)

Descriptions per tid (result)

('burger', 1)

	result
count	22.0
mean	7.0
std	0.0
min	7.0
25%	7.0
50%	7.0
75%	7.0
max	7.0

normaltest
NormaltestResult(statistic=1.0828149152562685, pvalue=0.58192863582398746)

('burger', 2)

	result
count	22.0
mean	6.90909090909
std	0.294244943168
min	6.0
25%	7.0
50%	7.0
75%	7.0
max	7.0

normaltest
NormaltestResult(statistic=32.977747192506648, pvalue=6.901971860763698e-08)

('burger', 3)

	result
count	22.0
mean	6.77272727273
std	0.751621623515
min	4.0
25%	7.0
50%	7.0
75%	7.0
max	7.0

normaltest
NormaltestResult(statistic=37.132620570418851, pvalue=8.6447789726675352e-09)

('burger', 4)

	result
count	22.0
mean	6.90909090909
std	0.294244943168
min	6.0
25%	7.0
50%	7.0
75%	7.0
max	7.0

normaltest
NormaltestResult(statistic=32.977747192506648, pvalue=6.901971860763698e-08)

('burger', 5)

	result
count	22.0
mean	6.95454545455
std	0.213200716356
min	6.0
25%	7.0
50%	7.0
75%	7.0
max	7.0

normaltest
NormaltestResult(statistic=55.867295667147516, pvalue=7.3887485384492e-13)

('swipe', 1)

	result
count	28.0
mean	6.85714285714
std	0.448395139423
min	5.0
25%	7.0
50%	7.0

	result
75%	7.0
max	7.0

normaltest
NormaltestResult(statistic=43.18815831051505, pvalue=4.1861094680904202e-10)

('swipe', 2)

	result
count	28.0
mean	6.92857142857
std	0.262265264156
min	6.0
25%	7.0
50%	7.0
75%	7.0
max	7.0

normaltest
NormaltestResult(statistic=44.203532340976452, pvalue=2.5195612001886847e-10)

('swipe', 3)

	result
count	28.0
mean	6.82142857143
std	0.475594865606
min	5.0
25%	7.0
50%	7.0
75%	7.0
max	7.0

normaltest
NormaltestResult(statistic=34.427175981240801, pvalue=3.3437494037083985e-08)

('swipe', 4)

	result
count	28.0
mean	6.82142857143
std	0.475594865606
min	5.0
25%	7.0
50%	7.0
75%	7.0
max	7.0

normaltest
NormaltestResult(statistic=34.427175981240801, pvalue=3.3437494037083985e-08)

('swipe', 5)

	result
count	28.0
mean	6.75
std	0.585314097381
min	5.0
25%	7.0
50%	7.0
75%	7.0
max	7.0

normaltest
NormaltestResult(statistic=24.938342419703677, pvalue=3.843330652607647e-06)

Cross-compare Tests per tid (result)

('burger', 1) vs ('burger', 2)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=0.0, pvalue=0.15729920705028502), 'effect_size': 0.0, 'N': 44}

('burger', 1) vs ('burger', 3)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=0.0, pvalue=0.17971249487899976), 'effect_size': 0.0, 'N': 44}

('burger', 1) vs ('burger', 4)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=0.0, pvalue=0.15729920705028502), 'effect_size': 0.0, 'N': 44}

('burger', 1) vs ('burger', 5)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=0.0, pvalue=0.31731050786291415), 'effect_size': 0.0, 'N': 44}

('burger', 1) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=275.0, pvalue=0.061389171314485569), 'effect_size': 0.1071428571428571, 'N': 50}

('burger', 1) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=286.0, pvalue=0.10790037602663682), 'effect_size': 0.071428571428571397, 'N': 50}

('burger', 1) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=264.0, pvalue=0.035323810007342034), 'effect_size': 0.1428571428571429, 'N': 50}

('burger', 1) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=264.0, pvalue=0.035323810007342034), 'effect_size': 0.1428571428571429, 'N': 50}

('burger', 1) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=253.0, pvalue=0.020341356769343476), 'effect_size': 0.1785714285714286, 'N': 50}

('burger', 2) vs ('burger', 3)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=3.0, pvalue=0.46145098783336069), 'effect_size': 0.0030975735673722249, 'N': 44}

('burger', 2) vs ('burger', 4)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=5.0, pvalue=1.0), 'effect_size': 0.0051626226122870418, 'N': 44}

('burger', 2) vs ('burger', 5)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=2.0, pvalue=0.5637028616507731), 'effect_size': 0.002065049044914816 9, 'N': 44}

('burger', 2) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=302.0, pvalue=0.41814383343092509), 'effect_size': 0.019480519480519431, 'N': 50}

('burger', 2) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=302.0, pvalue=0.40954587077471732), 'effect_size': 0.019480519480519431, 'N': 50}

('burger', 2) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=291.0, pvalue=0.28360268156813595), 'effect_size': 0.055194805194805241, 'N': 50}

('burger', 2) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=291.0, pvalue=0.28360268156813595), 'effect_size': 0.055194805194805241, 'N': 50}

('burger', 2) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=279.0, pvalue=0.1776214834950835), 'effect_size': 0.094155844155844104, 'N': 50}

('burger', 3) vs ('burger', 4)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=1.5, pvalue=0.41421617824252521), 'effect_size': 0.0015487867836861124, 'N': 44}

('burger', 3) vs ('burger', 5)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=0.0, pvalue=0.17971249487899976), 'effect_size': 0.0, 'N': 44}

('burger', 3) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=305.5, pvalue=0.47007151426311133), 'effect_size': 0.008116883116883078, 'N': 50}

('burger', 3) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=300.0, pvalue=0.37768095297605236), 'effect_size': 0.025974025974025983, 'N': 50}

('burger', 3) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=295.5, pvalue=0.3388315325050939), 'effect_size': 0.040584415584415612, 'N': 50}

('burger', 3) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=295.5, pvalue=0.3388315325050939), 'effect_size': 0.040584415584415612, 'N': 50}

('burger', 3) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=285.0, pvalue=0.23293475501797717), 'effect_size': 0.074675324675324672, 'N': 50}

('burger', 4) vs ('burger', 5)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=0.0, pvalue=0.31731050786291415), 'effect_size': 0.0, 'N': 44}

('burger', 4) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=302.0, pvalue=0.41814383343092509), 'effect_size': 0.019480519480519431, 'N': 50}

('burger', 4) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=302.0, pvalue=0.40954587077471732), 'effect_size': 0.019480519480519431, 'N': 50}

('burger', 4) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=291.0, pvalue=0.28360268156813595), 'effect_size': 0.055194805194805241, 'N': 50}

('burger', 4) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=291.0, pvalue=0.28360268156813595), 'effect_size': 0.055194805194805241, 'N': 50}

('burger', 4) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=279.0, pvalue=0.1776214834950835), 'effect_size': 0.094155844155844104, 'N': 50}

('burger', 5) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=288.5, pvalue=0.21488485789583234), 'effect_size': 0.063311688311688319, 'N': 50}

('burger', 5) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=300.0, pvalue=0.36081607462259746), 'effect_size': 0.025974025974025983, 'N': 50}

('burger', 5) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=277.5, pvalue=0.12983938884427548), 'effect_size': 0.099025974025974017, 'N': 50}

('burger', 5) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=277.5, pvalue=0.12983938884427548), 'effect_size': 0.099025974025974017, 'N': 50}

('burger', 5) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=266.0, pvalue=0.07519977300947886), 'effect_size': 0.13636363636363635, 'N': 50}

('swipe', 1) vs ('swipe', 2)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=1.5, pvalue=0.41421617824252521), 'effect_size': 0.00095632770162575704, 'N': 56}

('swipe', 1) vs ('swipe', 3)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=2.0, pvalue=0.5637028616507731), 'effect_size': 0.0012751036021676761, 'N': 56}

('swipe', 1) vs ('swipe', 4)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=2.0, pvalue=0.5637028616507731), 'effect_size': 0.0012751036021676761, 'N': 56}

('swipe', 1) vs ('swipe', 5)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=0.0, pvalue=0.083264516663550406), 'effect_size': 0.0, 'N': 56}

('swipe', 2) vs ('swipe', 3)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=2.0, pvalue=0.25683925795785656), 'effect_size': 0.0012751036021676761, 'N': 56}

('swipe', 2) vs ('swipe', 4)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=2.0, pvalue=0.25683925795785656), 'effect_size': 0.0012751036021676761, 'N': 56}

('swipe', 2) vs ('swipe', 5)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=0.0, pvalue=0.058781721355358862), 'effect_size': 0.0, 'N': 56}

('swipe', 3) vs ('swipe', 4)

{'n1': 28, 'n2': 28, 'test_result': '=== All pairs were equal ===', 'effect_size': '=== All pairs were equal ===', 'N': 56}

('swipe', 3) vs ('swipe', 5)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=1.5, pvalue=0.41421617824252521), 'effect_size': 0.00095632770162575704, 'N': 56}

('swipe', 4) vs ('swipe', 5)

{'n1': 28, 'n2': 28, 'test_result': WilcoxonResult(statistic=1.5, pvalue=0.41421617824252521), 'effect_size': 0.00095632770162575704, 'N': 56}

Global Burger vs Swipe per tid Tests (result)

burger vs swipe 1

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=1473.0, pvalue=0.21665236926243431), 'effect_size': 0.043506493506493493, 'N': 138}

burger vs swipe 2

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=1530.0, pvalue=0.45320928415997419), 'effect_size': 0.0064935064935064402, 'N': 138}

burger vs swipe 3

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=1419.0, pvalue=0.087083010808927386), 'effect_size': 0.078571428571428625, 'N': 138}

burger vs swipe 4

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=1419.0, pvalue=0.087083010808927386), 'effect_size': 0.078571428571428625, 'N': 138}

burger vs swipe 5

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=1362.0, pvalue=0.027199345369874211), 'effect_size': 0.11558441558441557, 'N': 138}

Global Burger vs Global Swipe Test (result)

burger vs swipe

{'n1': 110, 'n2': 140, 'test_result': MannwhitneyuResult(statistic=7203.0, pvalue=0.046318608676750285), 'effect_size': 0.064545454545454573, 'N': 250}

Task Question 1

Descriptions (result)

Global Descriptions (result)

burger

	result
count	110.0
mean	1.89090909091
std	1.80897585981
min	1.0
25%	1.0
50%	1.0
75%	1.0
max	7.0

normaltest
NormaltestResult(statistic=41.10183363779808, pvalue=1.1880924265582291e-09)

swipe

	result
count	140.0
mean	2.86428571429
std	2.12964925773
min	1.0
25%	1.0
50%	2.0
75%	4.0
max	7.0

normaltest
NormaltestResult(statistic=18.788553344848623, pvalue=8.3198879945244137e-05)

Repeated measures (result)

burger

KruskalResult(statistic=0.78069084963312274, pvalue=0.94101782074422269)
FriedmanchisquareResult(statistic=2.7575757575757125, pvalue=0.59917784877228941)

swipe

KruskalResult(statistic=2.0615941350657225, pvalue=0.72443103796977781)
FriedmanchisquareResult(statistic=5.4968553459119409, pvalue=0.24000603548291879)

Descriptions per tid (result)

('burger', 1)

	result
count	22.0
mean	1.95454545455
std	2.01133153544
min	1.0
25%	1.0
50%	1.0
75%	1.0
max	7.0

normaltest
NormaltestResult(statistic=14.852104558574464, pvalue=0.0005955338788882189 1)

(‘burger’, 2)

	result
count	22.0
mean	1.77272727273
std	1.87545088374
min	1.0
25%	1.0
50%	1.0
75%	1.0
max	7.0

normaltest
NormaltestResult(statistic=20.210686165265589, pvalue=4.08606491047461e-05)

(‘burger’, 3)

	result
count	22.0
mean	2.0
std	1.74574312189
min	1.0
25%	1.0
50%	1.0
75%	2.0
max	6.0

normaltest
NormaltestResult(statistic=9.2076296409072071, pvalue=0.010013562844574659)

(‘burger’, 4)

	result
count	22.0
mean	1.77272727273
std	1.54092792643
min	1.0
25%	1.0
50%	1.0
75%	1.0
max	6.0

	result

normaltest
NormaltestResult(statistic=13.258524513028126, pvalue=0.0013211373870855303)

('burger', 5)

	result
count	22.0
mean	1.95454545455
std	1.98751514465
min	1.0
25%	1.0
50%	1.0
75%	1.0
max	7.0

normaltest
NormaltestResult(statistic=13.11454314032791, pvalue=0.0014197541301194895)

('swipe', 1)

	result
count	28.0
mean	2.75
std	2.36682315602
min	1.0
25%	1.0
50%	1.0
75%	4.25
max	7.0

normaltest
NormaltestResult(statistic=5.6255405651946386, pvalue=0.060038438357067736)

('swipe', 2)

	result
count	28.0
mean	2.67857142857
std	2.21198036674
min	1.0

	result
25%	1.0
50%	1.0
75%	4.0
max	7.0

normaltest
NormaltestResult(statistic=4.9857181545995557, pvalue=0.082673259115518136)

('swipe', 3)

	result
count	28.0
mean	2.82142857143
std	2.16116517662
min	1.0
25%	1.0
50%	2.0
75%	4.0
max	7.0

normaltest
NormaltestResult(statistic=4.8948691150333712, pvalue=0.086515251945615837)

('swipe', 4)

	result
count	28.0
mean	2.85714285714
std	1.87999774851
min	1.0
25%	1.0
50%	3.0
75%	4.0
max	7.0

normaltest
NormaltestResult(statistic=3.2631829602951457, pvalue=0.19561800409388738)

('swipe', 5)

	result
count	28.0
mean	3.21428571429
std	2.11445015806
min	1.0
25%	1.0
50%	3.0
75%	4.0
max	7.0

normaltest
NormaltestResult(statistic=2.7864677335567007, pvalue=0.24827112927752484)

Cross-compare Tests per tid (result)

('burger', 1) vs ('burger', 2)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=7.5, pvalue=1.0), 'effect_size': 0.0077439339184305631, 'N': 44}

('burger', 1) vs ('burger', 3)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=14.0, pvalue=0.56869370493349436), 'effect_size': 0.014455343314403717, 'N': 44}

('burger', 1) vs ('burger', 4)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=6.0, pvalue=0.68027954733445029), 'effect_size': 0.0061951471347444498, 'N': 44}

('burger', 1) vs ('burger', 5)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=5.0, pvalue=1.0), 'effect_size': 0.0051626226122870418, 'N': 44}

('burger', 1) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=247.5, pvalue=0.082098002975044604), 'effect_size': 0.1964285714285714, 'N': 50}

('burger', 1) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=241.5, pvalue=0.066396878662638464), 'effect_size': 0.21590909090909094, 'N': 50}

('burger', 1) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=213.5, pvalue=0.020092875062028004), 'effect_size': 0.30681818181818177, 'N': 50}

('burger', 1) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=198.5, pvalue=0.010019521264436585), 'effect_size': 0.35551948051948057, 'N': 50}

('burger', 1) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=192.0, pvalue=0.0068101408106697112), 'effect_size': 0.37662337662337664, 'N': 50}

('burger', 2) vs ('burger', 3)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=6.5, pvalue=0.39510806859049219), 'effect_size': 0.0067114093959731542, 'N': 44}

('burger', 2) vs ('burger', 4)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=10.5, pvalue=1.0), 'effect_size': 0.010841507485802787, 'N': 44}

('burger', 2) vs ('burger', 5)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=9.0, pvalue=0.73888268036352733), 'effect_size': 0.0092927207021166747, 'N': 44}

('burger', 2) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=232.5, pvalue=0.038182542965196922), 'effect_size': 0.24512987012987009, 'N': 50}

('burger', 2) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=225.5, pvalue=0.028699028147674787), 'effect_size': 0.2678571428571429, 'N': 50}

('burger', 2) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=194.5, pvalue=0.006237393352598957 8), 'effect_size': 0.36850649350649356, 'N': 50}

('burger', 2) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=179.5, pvalue=0.0028888514521789059), 'effect_size': 0.41720779220779225, 'N': 50}

('burger', 2) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=173.0, pvalue=0.001845925801493757), 'effect_size': 0.43831168831168832, 'N': 50}

('burger', 3) vs ('burger', 4)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=9.0, pvalue=0.3885437838475907), 'effect_size': 0.0092927207021166747, 'N': 44}

('burger', 3) vs ('burger', 5)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=13.0, pvalue=0.86456930168674195), 'effect_size': 0.013422818791946308, 'N': 44}

('burger', 3) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=260.5, pvalue=0.14603135541294709), 'effect_size': 0.15422077922077926, 'N': 50}

('burger', 3) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=256.0, pvalue=0.12750985422970523), 'effect_size': 0.16883116883116878, 'N': 50}

('burger', 3) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=230.0, pvalue=0.049115891184390158), 'effect_size': 0.25324675324675328, 'N': 50}

('burger', 3) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=215.0, pvalue=0.026326679220802538), 'effect_size': 0.30194805194805197, 'N': 50}

('burger', 3) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=203.5, pvalue=0.014613622667340618), 'effect_size': 0.3392857142857143, 'N': 50}

('burger', 4) vs ('burger', 5)

{'n1': 22, 'n2': 22, 'test_result': WilcoxonResult(statistic=1.5, pvalue=0.19364643126922065), 'effect_size': 0.0015487867836861124, 'N': 44}

('burger', 4) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=238.5, pvalue=0.054909704407618581), 'effect_size': 0.22564935064935066, 'N': 50}

('burger', 4) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=233.0, pvalue=0.044870412680933683), 'effect_size': 0.24350649350649356, 'N': 50}

('burger', 4) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=209.0, pvalue=0.015775210433546256), 'effect_size': 0.3214285714285714, 'N': 50}

('burger', 4) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=192.5, pvalue=0.0070352388832014452), 'effect_size': 0.375, 'N': 50}

('burger', 4) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=183.5, pvalue=0.0040067153811422793), 'effect_size': 0.40422077922077926, 'N': 50}

('burger', 5) vs ('swipe', 1)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=246.0, pvalue=0.077014874525015403), 'effect_size': 0.20129870129870131, 'N': 50}

('burger', 5) vs ('swipe', 2)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=240.5, pvalue=0.063535812872022673), 'effect_size': 0.2191558441558441, 'N': 50}

('burger', 5) vs ('swipe', 3)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=211.5, pvalue=0.01809715117525822), 'effect_size': 0.31331168831168832, 'N': 50}

('burger', 5) vs ('swipe', 4)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=198.5, pvalue=0.010033737896491264), 'effect_size': 0.35551948051948057, 'N': 50}

('burger', 5) vs ('swipe', 5)

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=190.5, pvalue=0.0062419441538161761), 'effect_size': 0.38149350649350644, 'N': 50}

('swipe', 1) vs ('swipe', 2)

{'n2': 28, 'test_result': Ttest_relResult(statistic=0.18569533817705183, pvalue=0.8540717092857345), 'N': 56, 'n1': 28, 'df': 27, 'effect_size': 0.035093120317179816}

('swipe', 1) vs ('swipe', 3)

{'n2': 28, 'test_result': Ttest_relResult(statistic=-0.25384865729693323, pvalue=0.80153564704995517), 'N': 56, 'n1': 28, 'df': 27, 'effect_size': -0.047972886989667646}

('swipe', 1) vs ('swipe', 4)

{'n2': 28, 'test_result': Ttest_relResult(statistic=-0.2825869881107243, pvalue=0.77964854494580593), 'N': 56, 'n1': 28, 'df': 27, 'effect_size': -0.05340392102026733}

('swipe', 1) vs ('swipe', 5)

{'n2': 28, 'test_result': Ttest_relResult(statistic=-1.2118660185275947, pvalue=0.23606280739392285), 'N': 56, 'n1': 28, 'df': 27, 'effect_size': -0.22902115052528635}

('swipe', 2) vs ('swipe', 3)

{'n2': 28, 'test_result': Ttest_relResult(statistic=-0.53737329062387895, pvalue=0.5954113366515259), 'N': 56, 'n1': 28, 'df': 27, 'effect_size': -0.10155400629994435}

('swipe', 2) vs ('swipe', 4)

{'n2': 28, 'test_result': Ttest_relResult(statistic=-0.50083542247063328, pvalue=0.62054550807787923), 'N': 56, 'n1': 28, 'df': 27, 'effect_size': -0.094648998259233286}

('swipe', 2) vs ('swipe', 5)

{'n2': 28, 'test_result': Ttest_relResult(statistic=-1.5616592479102798, pvalue=0.13001443262320639), 'N': 56, 'n1': 28, 'df': 27, 'effect_size': -0.29512585732819752}

('swipe', 3) vs ('swipe', 4)

{'n2': 28, 'test_result': Ttest_relResult(statistic=-0.11824716716574642, pvalue=0.90674715458336475), 'N': 56, 'n1': 28, 'df': 27, 'effect_size': -0.022346614111317671}

('swipe', 3) vs ('swipe', 5)

{'n2': 28, 'test_result': Ttest_relResult(statistic=-1.4607872576624297, pvalue=0.15561417089917387), 'N': 56, 'n1': 28, 'df': 27, 'effect_size': -0.27606284301048722}

('swipe', 4) vs ('swipe', 5)

{'n2': 28, 'test_result': Ttest_relResult(statistic=-1.2048289933537484, pvalue=0.23872409198062031), 'N': 56, 'n1': 28, 'df': 27, 'effect_size': -0.22769127776959361}

Global Burger vs Swipe per tid Tests (result)

burger vs swipe 1

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=1225.0, pvalue=0.017143625211004959), 'effect_size': 0.20454545454545459, 'N': 138}

burger vs swipe 2

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=1196.5, pvalue=0.011075983661422355), 'effect_size': 0.22305194805194806, 'N': 138}

burger vs swipe 3

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=1058.5, pvalue=0.0008782863887674481 8), 'effect_size': 0.31266233766233764, 'N': 138}

burger vs swipe 4

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=984.0, pvalue=0.00018652482417813029), 'effect_size': 0.36103896103896105, 'N': 138}

burger vs swipe 5

{'n1': 110, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=942.5, pvalue=6.5526352124271008e-05), 'effect_size': 0.38798701298701299, 'N': 138}

Global Burger vs Global Swipe Test (result)

burger vs swipe

{'n1': 110, 'n2': 140, 'test_result': MannwhitneyuResult(statistic=5406.5, pvalue=2.9062055593999374e-06), 'effect_size': 0.29785714285714282, 'N': 250}

Final Questionnaires

Final Question 0

Just counts grouped by Results

Navigation burger answered 1 stars: 16
Navigation burger answered 2 stars: 4
Navigation burger answered 4 stars: 1
Navigation burger answered 5 stars: 1
Navigation swipe answered 1 stars: 21
Navigation swipe answered 2 stars: 4
Navigation swipe answered 3 stars: 1
Navigation swipe answered 4 stars: 1
Navigation swipe answered 7 stars: 1

0 Description

	result
count	50.0
mean	1.52

	result
std	1.18218062089
min	1.0
25%	1.0
50%	1.0
75%	1.75
max	7.0

Descriptions (result)

Global Descriptions (result)

burger

	result
count	22.0
mean	1.5
std	1.05785047102
min	1.0
25%	1.0
50%	1.0
75%	1.75
max	5.0

normaltest
NormaltestResult(statistic=26.197588687579557, pvalue=2.0476979566055249e-06)

swipe

	result
count	28.0
mean	1.53571428571
std	1.29048204766
min	1.0
25%	1.0
50%	1.0
75%	1.25
max	7.0

normaltest

NormaltestResult(statistic=43.488260518740518, pvalue=3.6028336850503621e-10)

Global Burger vs Global Swipe Test (result)

burger vs swipe

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=302.5, pvalue=0.44941800310214225), 'effect_size': 0.017857142857142905, 'N': 50}

Final Question 1

Just counts grouped by Results

Navigation burger answered 1 stars: 13
Navigation burger answered 2 stars: 3
Navigation burger answered 4 stars: 1
Navigation burger answered 5 stars: 4
Navigation burger answered 6 stars: 1
Navigation swipe answered 1 stars: 17
Navigation swipe answered 2 stars: 8
Navigation swipe answered 4 stars: 2
Navigation swipe answered 6 stars: 1

1 Description

	result
count	50.0
mean	1.92
std	1.49611742418
min	1.0
25%	1.0
50%	1.0
75%	2.0
max	6.0

Descriptions (result)

Global Descriptions (result)

burger

	result
count	22.0
mean	2.22727272727
std	1.79766563398
min	1.0
25%	1.0
50%	1.0
75%	3.5
max	6.0

normaltest
NormaltestResult(statistic=4.9137570390411183, pvalue=0.085702051156163167)

swipe

	result
count	28.0
mean	1.67857142857
std	1.18801332542
min	1.0
25%	1.0
50%	1.0
75%	2.0
max	6.0

normaltest
NormaltestResult(statistic=28.457743224410187, pvalue=6.6142342997665578e-07)

Global Burger vs Global Swipe Test (result)

burger vs swipe

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=281.0, pvalue=0.27788843237866634), 'effect_size': 0.087662337662337664, 'N': 50}

Final Question 2

Just counts grouped by Results

Navigation burger answered 1 stars: 17
Navigation burger answered 2 stars: 5

Navigation swipe answered 1 stars: 18
Navigation swipe answered 2 stars: 5
Navigation swipe answered 3 stars: 2
Navigation swipe answered 4 stars: 2
Navigation swipe answered 7 stars: 1

2 Description

	result
count	50.0
mean	1.52
std	1.09246024539
min	1.0
25%	1.0
50%	1.0
75%	2.0
max	7.0

Descriptions (result)

Global Descriptions (result)

burger

	result
count	22.0
mean	1.22727272727
std	0.428932027229
min	1.0
25%	1.0
50%	1.0
75%	1.0
max	2.0

normaltest
NormaltestResult(statistic=7.0141044989524168, pvalue=0.029985173100470022)

swipe

	result
count	28.0
mean	1.75

	result
std	1.37773297418
min	1.0
25%	1.0
50%	1.0
75%	2.0
max	7.0

normaltest
NormaltestResult(statistic=30.833945386464563, pvalue=2.0160153368124402e-07)

Global Burger vs Global Swipe Test (result)

burger vs swipe

{'n1': 22, 'n2': 28, 'test_result': MannwhitneyuResult(statistic=255.5, pvalue=0.10358134878107761), 'effect_size': 0.17045454545454541, 'N': 50}

Final Question 3

Just counts grouped by Results

Navigation burger answered 2 stars: 1
Navigation burger answered 3 stars: 5
Navigation burger answered 4 stars: 1
Navigation burger answered 5 stars: 4
Navigation burger answered 6 stars: 5
Navigation burger answered 7 stars: 6
Navigation swipe answered 1 stars: 1
Navigation swipe answered 2 stars: 1
Navigation swipe answered 3 stars: 3
Navigation swipe answered 4 stars: 11
Navigation swipe answered 5 stars: 5
Navigation swipe answered 6 stars: 4
Navigation swipe answered 7 stars: 3

3 Description

	result
count	50.0
mean	4.78

	result
std	1.56869892794
min	1.0
25%	4.0
50%	5.0
75%	6.0
max	7.0

Descriptions (result)

Global Descriptions (result)

burger

	result
count	22.0
mean	5.13636363636
std	1.67034226733
min	2.0
25%	3.25
50%	5.5
75%	6.75
max	7.0

normaltest
NormaltestResult(statistic=4.4344935502051488, pvalue=0.1089085461474571)

swipe

	result
count	28.0
mean	4.5
std	1.45296631451
min	1.0
25%	4.0
50%	4.0
75%	5.25
max	7.0

normaltest
NormaltestResult(statistic=0.29622233841262957, pvalue=0.86233524448851595)

Global Burger vs Global Swipe Test (result)

burger vs swipe

{‘n2’: 28, ‘test_result’: Ttest_indResult(statistic=1.4151306918873736, pvalue=0.16442349507017537), ‘N’: 50, ‘n1’: 22, ‘df’: 41.879320839518563, ‘effect_size’: 0.40317277353302849}