

TABLE B.4 Critical Values for the Mann-Whitney *U*-Test Statistic.

$\alpha$	$m$	$n$																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0.10	1																				
	2																				
	3		0	1																	
	4		0	1	3																
	5		1	2	4	5															
	6		1	3	5	7	9														
	7		1	4	6	8	11	13													
	8		2	5	7	10	13	16	19												
	9	0	2	5	9	12	15	18	22	25											
	10	0	3	6	10	13	17	21	24	28	32										
	11	0	3	7	11	15	19	23	27	31	36	40									
	12	0	4	8	12	17	21	26	30	35	39	44	49								
	13	0	4	9	13	18	23	28	33	38	43	48	53	58							
	14	0	5	10	15	20	25	31	36	41	47	52	58	63	69						
	15	0	5	10	16	22	27	33	39	45	51	57	63	68	74	80					
	16	0	5	11	17	23	29	36	42	48	54	61	67	74	80	86	93				
	17	0	6	12	18	25	31	38	45	52	58	65	72	79	85	92	99	106			
	18	0	6	13	20	27	34	41	48	55	62	69	77	84	91	98	106	113	120		
	19	1	7	14	21	28	36	43	51	58	66	73	81	89	97	104	112	120	128	135	
	20	1	7	15	22	30	38	46	54	62	70	78	86	94	102	110	119	127	135	143	151
0.05	1																				
	2																				
	3			0																	
	4			0	1																
	5		0	1	2	4															
	6		0	2	3	5	7														
	7		0	2	4	6	8	11													
	8		1	3	5	8	10	13	15												
	9		1	4	6	9	12	15	18	21											
	10		1	4	7	11	14	17	20	24	27										
	11		1	5	8	12	16	19	23	27	31	34									
	12		2	5	9	13	17	21	26	30	34	38	42								
	13		2	6	10	15	19	24	28	33	37	42	47	51							
	14		3	7	11	16	21	26	31	36	41	46	51	56	61						
	15		3	7	12	18	23	28	33	39	44	50	55	61	66	72					
	16		3	8	14	19	25	30	36	42	48	54	60	65	71	77	83				
	17		3	9	15	20	26	33	39	45	51	57	64	70	77	83	89	96			
	18		4	9	16	22	28	35	41	48	55	61	68	75	82	88	95	102	109		
	19	0	4	10	17	23	30	37	44	51	58	65	72	80	87	94	101	109	116	123	
	20	0	4	11	18	25	32	39	47	54	62	69	77	84	92	100	107	115	123	130	138
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

		$n$																				
$\alpha$	$m$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
0.025	1																					
	2																					
	3																					
	4				0																	
	5			0	1	2																
	6			1	2	3	5															
	7			1	3	5	6	8														
	8	0	2	4	6	8	10	13														
	9	0	2	4	7	10	12	15	17													
	10	0	3	5	8	11	14	17	20	23												
	11	0	3	6	9	13	16	19	23	26	30											
	12	1	4	7	11	14	18	22	26	29	33	37										
	13	1	4	8	12	16	20	24	28	33	37	41	45									
	14	1	5	9	13	17	22	26	31	36	40	45	50	55								
	15	1	5	10	14	19	24	29	34	39	44	49	54	59	64							
	16	1	6	11	15	21	26	31	37	42	47	53	59	64	70	75						
	17	2	6	11	17	22	28	34	39	45	51	57	63	69	75	81	87					
	18	2	7	12	18	24	30	36	42	48	55	61	67	74	80	86	93	99				
	19	2	7	13	19	25	32	38	45	52	58	65	72	78	85	92	99	106	113			
	20	2	8	14	20	27	34	41	48	55	62	69	76	83	90	98	105	112	119	127		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
0.01	1																					
	2																					
	3																					
	4																					
	5				0	1																
	6				1	2	3															
	7			0	1	3	4	6														
	8			0	2	4	6	7	9													
	9			1	3	5	7	9	11	14												
	10			1	3	6	8	11	13	16	19											
	11			1	4	7	9	12	15	18	22	25										
	12			2	5	8	11	14	17	21	24	28	31									
	13	0	2	5	9	12	16	20	23	27	31	35	39									
	14	0	2	6	10	13	17	22	26	30	34	38	43	47								
	15	0	3	7	11	15	19	24	28	33	37	42	47	51	56							
	16	0	3	7	12	16	21	26	31	36	41	46	51	56	61	66						
	17	0	4	8	13	18	23	28	33	38	44	49	55	60	66	71	77					
	18	0	4	9	14	19	24	30	36	41	47	53	59	65	70	76	82	88				
	19	1	4	9	15	20	26	32	38	44	50	56	63	69	75	82	88	94	101			
	20	1	5	10	16	22	28	34	40	47	53	60	67	73	80	87	93	100	107	114		

Source: Adapted from Milton, R. C. (1964). An extended table of critical values for the Mann-Whitney (Wilcoxon) two-sample statistic. *Journal of the American Statistical Association*, 59, 925-934. Reprinted with permission from *The Journal of the American Statistical Association*. Copyright 1964 by the American Statistical Association. All rights reserved.