Essays in Theoretical and Empirical Microeconomics and Macroecoconomics with Implications for Social Policy All Around the World

Inaugural-Dissertation

zur Erlangung des Grades eines Doktors der Wirtschafts- und Gesellschaftswissenschaften

durch

die Rechts- und Staatswissenschaftliche Fakultät der Rheinischen Friedrich-Wilhelms-Universität Bonn

vorgelegt von

I. M. Béta Zane-Ål

aus Summacumlaudeville

2018

Tag der Promotion: 11. November 2018

Dekan: Prof. Dr. Jürgen von Hagen

Erstreferent: Prof. Dr. Armin Falk

Zweitreferent: Prof. Dr. Hans-Martin von Gaudecker

Tag der mündlichen Prüfung: 11. November 2018

Acknowledgements

I would like to thank Holger Gerhardt for TeXnical assistance.

I blame all of you. Writing this book has been an exercise in sustained suffering. The casual reader may, perhaps, exempt herself from excessive guilt, but for those of you who have played the larger role in prolonging my agonies with your encouragement and support, well ... you know who you are, and you owe me.

—Brendan Pietsch, assistant professor of religious studies at Nazarbayev University in Astana, Kazakhstan

Source: https://www.timeshighereducation.com/ blog/best-academic-acknowledgements-ever

Contents

Ac	knov	vledge	ments	iii
Lis	st of	Figures	5	хi
Lis	st of	Tables		xiii
Int	trodu	ıction		1
	Refe	erence	S	4
1	My J	ob Ma	rket Paper	5
	1.1	Intro	duction	5
	1.2	Meth	ods	7
		1.2.1	Design of the Main Experiment	7
		1.2.2	Predictions	12
	1.3	Resul	ts	17
		1.3.1	Test of Hypothesis 3	18
			Test of Hypothesis 4	19
		1.3.3	Heterogeneity	19
		1.3.4	Structural Estimation	21
	1.4	Discu	ssion	21
		1.4.1	Some Limitations	21
		1.4.2	Utility from Money	23
	1.5	Concl	usion	24
	App	endix	1.A Put More Complicated Derivations and Proofs Here	24
		1.A.1	Appendix Subsection	24
		1.A.2	Salience	26
	App	endix	1.B Some Additional Figures	27
	App	endix	1.C siunitx Example Tables	30
	Refe	erence	s	32
2	My	Second	l Paner	35

vi | Contents

	2.1	Introdu	action	35
	2.2	Method	ls	37
		2.2.1 I	Design of the Main Experiment	37
		2.2.2 I	Predictions	42
	2.3	Results		47
		2.3.1	Test of Hypothesis 3	48
		2.3.2	Test of Hypothesis 4	49
		2.3.3 I	Heterogeneity	49
		2.3.4	Structural Estimation	51
	2.4	Discuss	sion	52
		2.4.1	Some Limitations	52
		2.4.2 U	Utility from Money	52
	2.5	Conclu	sion	54
	App	endix 2.	A Put More Complicated Derivations and Proofs Here	55
		2.A.1	Appendix Subsection	55
		2.A.2 S	Salience	56
	App	endix 2.	B Some Additional Figures	57
	App	endix 2.	C siunitx Example Tables	60
	Refe	erences		62
3	Mat	h Tests		65
	3.1	Math T	est Serif	65
			Overview Serif	65
			Formulas <mark>Serif</mark>	66
		3.1.3	Math Alphabets Serif	67
		3.1.4	Character Sidebearings Serif	68
		3.1.5	Superscript Positioning <mark>Serif</mark>	69
		3.1.6	Subscript Positioning <mark>Serif</mark>	70
		3.1.7	Accent Positioning Serif	71
		3.1.8 I	Differentials Serif	73
		3.1.9	Slash Kerning Serif	74
			Big Operators Serif	75
			Radicals Serif	75
			Over- and Underbraces Serif	75
		3.1.13	Normal and Wide Accents Serif	75
			Long Arrows Serif	75
			Left and Right Delimiters <mark>Serif</mark>	75
			Big-g-g Delimiters Serif	76
			Binary Operators Serif	76
		2 1 1 2 1	Relations Serif	77

	Contents vii
3.1.19 Punctuation Serif	77
3.1.20 Arrows Serif	77
3.1.21 Miscellaneous Symbols Serif	78
3.1.22 Variable-Sized Operators Serif	78
3.1.23 Log-Like Operators Serif	78
3.1.24 Delimiters Serif	78
3.1.25 Large Delimiters Serif	78
3.1.26 Math Mode Accents Serif	79
3.1.27 Miscellaneous Constructions Serif	79
3.1.28 AMS Delimiters Serif	79
3.1.29 AMS Arrows Serif	79
3.1.30 AMS Negated Arrows Serif	79
3.1.31 AMS Greek Serif	80
3.1.32 AMS Hebrew Serif	80
3.1.33 AMS Miscellaneous Serif	80
3.1.34 AMS Binary Operators Serif	80
3.1.35 AMS Relations Serif	81
3.1.36 AMS Negated Relations Serif	82
3.2 Math Test Serif Bold	82
3.2.1 Overview Serif Bold	82
3.2.2 Formulas Serif Bold	83
3.2.3 Math Alphabets Serif Bold	84
3.2.4 Character Sidebearings Serif Bold	86
3.2.5 Superscript Positioning Serif Bold	87
3.2.6 Subscript Positioning Serif Bold	88
3.2.7 Accent Positioning Serif Bold	89
3.2.8 Differentials Serif Bold	90
3.2.9 Slash Kerning Serif Bold	91
3.2.10 Big Operators Serif Bold	92
3.2.11 Radicals Serif Bold	92
3.2.12 Over- and Underbraces Serif Bold	92
3.2.13 Normal and Wide Accents Serif Bold	92
3.2.14 Long Arrows Serif Bold	93
3.2.15 Left and Right Delimiters Serif Bold	93
3.2.16 Big-g-g Delimiters Serif Bold	93
3.2.17 Binary Operators Serif Bold	94
3.2.18 Relations Serif Bold	94
3.2.19 Punctuation Serif Bold	94
3.2.20 Arrows Serif Bold	94
3.2.21 Miscellaneous Symbols Serif Bold	95
3.2.22 Variable-Sized Operators Serif Bold	95

viii | Contents

	3.2.23 Log-Like Operators Serif Bold	95
	3.2.24 Delimiters Serif Bold	95
	3.2.25 Large Delimiters Serif Bold	95
	3.2.26 Math Mode Accents Serif Bold	96
	3.2.27 Miscellaneous Constructions Serif Bold	96
	3.2.28 AMS Delimiters Serif Bold	96
	3.2.29 AMS Arrows Serif Bold	96
	3.2.30 AMS Negated Arrows Serif Bold	96
	3.2.31 AMS Greek Serif Bold	97
	3.2.32 AMS Hebrew Serif Bold	97
	3.2.33 AMS Miscellaneous Serif Bold	97
	3.2.34 AMS Binary Operators Serif Bold	97
	3.2.35 AMS Relations Serif Bold	98
	3.2.36 AMS Negated Relations Serif Bold	99
3.3	Math Test Sans Serif	99
	3.3.1 Overview Sans Serif	99
	3.3.2 Formulas Sans Serif	100
	3.3.3 Math Alphabets Sans Serif	101
	3.3.4 Character Sidebearings Sans Serif	103
	3.3.5 Superscript Positioning Sans Serif	104
	3.3.6 Subscript Positioning Sans Serif	105
	3.3.7 Accent Positioning Sans Serif	106
	3.3.8 Differentials Sans Serif	107
	3.3.9 Slash Kerning Sans Serif	108
	3.3.10 Big Operators Sans Serif	109
	3.3.11 Radicals Sans Serif	109
	3.3.12 Over- and Underbraces Sans Serif	109
	3.3.13 Normal and Wide Accents Sans Serif	109
	3.3.14 Long Arrows Sans Serif	110
	3.3.15 Left and Right Delimiters Sans Serif	110
	3.3.16 Big-g-g Delimiters Sans Serif	110
	3.3.17 Binary Operators Sans Serif	111
	3.3.18 Relations Sans Serif	111
	3.3.19 Punctuation Sans Serif	111
	3.3.20 Arrows Sans Serif	111
	3.3.21 Miscellaneous Symbols Sans Serif	112
	3.3.22 Variable-Sized Operators Sans Serif	112
	3.3.23 Log-Like Operators Sans Serif	112
	3.3.24 Delimiters Sans Serif	112
	3.3.25 Large Delimiters Sans Serif	112
	3.3.26 Math Mode Accents Sans Serif	113

		Contents ix
	3.3.27 Miscellaneous Constructions Sans Serif	113
	3.3.28 AMS Delimiters Sans Serif	113
	3.3.29 AMS Arrows Sans Serif	113
	3.3.30 AMS Negated Arrows Sans Serif	113
	3.3.31 AMS Greek Sans Serif	114
	3.3.32 AMS Hebrew Sans Serif	114
	3.3.33 AMS Miscellaneous Sans Serif	114
	3.3.34 AMS Binary Operators Sans Serif	114
	3.3.35 AMS Relations Sans Serif	115
	3.3.36 AMS Negated Relations Sans Serif	116
3.4	Math Test Sans Serif Bold	116
	3.4.1 Overview Sans Serif Bold	116
	3.4.2 Formulas Sans Serif Bold	117
	3.4.3 Math Alphabets Sans Serif Bold	118
	3.4.4 Character Sidebearings Sans Serif Bold	120
	3.4.5 Superscript Positioning Sans Serif Bold	121
	3.4.6 Subscript Positioning Sans Serif Bold	122
	3.4.7 Accent Positioning Sans Serif Bold	123
	3.4.8 Differentials Sans Serif Bold	124
	3.4.9 Slash Kerning Sans Serif Bold	125
	3.4.10 Big Operators Sans Serif Bold	126
	3.4.11 Radicals Sans Serif Bold	126
	3.4.12 Over- and Underbraces Sans Serif Bold	126
	3.4.13 Normal and Wide Accents Sans Serif Bold	126
	3.4.14 Long Arrows Sans Serif Bold	127
	3.4.15 Left and Right Delimiters Sans Serif Bold	127
	3.4.16 Big-g-g Delimiters Sans Serif Bold	127
	3.4.17 Binary Operators Sans Serif Bold	128
	3.4.18 Relations Sans Serif Bold	128
	3.4.19 Punctuation Sans Serif Bold	128
	3.4.20 Arrows Sans Serif Bold	128
	3.4.21 Miscellaneous Symbols Sans Serif Bold	129
	3.4.22 Variable-Sized Operators Sans Serif Bold	129
	3.4.23 Log-Like Operators Sans Serif Bold	129
	3.4.24 Delimiters Sans Serif Bold	129
	3.4.25 Large Delimiters Sans Serif Bold	129
	3.4.26 Math Mode Accents Sans Serif Bold	130
	3.4.27 Miscellaneous Constructions Sans Serif Bold	130
	3.4.28 AMS Delimiters Sans Serif Bold	130
	3.4.29 AMS Arrows Sans Serif Bold	130
	3.4.30 AMS Negated Arrows Sans Serif Bold	130

x | Contents

3.4.31 AMS Greek Sans Serif Bold	131
3.4.32 AMS Hebrew Sans Serif Bold	131
3.4.33 AMS Miscellaneous Sans Serif Bold	131
3.4.34 AMS Binary Operators Sans Serif Bold	131
3.4.35 AMS Relations Sans Serif Bold	132
3.4.36 AMS Negated Relations Sans Serif Bold	133

List of Figures

1.1	Budget Sets $C_{1:1}^{\text{BAL}, \text{I}}$ and $C_{1:n}^{\text{UNBAL}, \text{I}}$	9
1.2	Budget Sets $C_{1:1}^{ ilde{BAL}, ext{II}}$ and $C_{n:1}^{ ilde{UNBAL}, ext{II}}$	9
1.3	Screenshots of a $BAL_{1:1}^{I}$ Decision (Top) and an $UNBAL_{1:8}^{I}$ Decision	
	(Bottom)	10
1.B.1	Earnings Sequences Included in Choice List $oldsymbol{C}_{ ext{CL}}^{ ext{BAL}}$	27
1.B.2	Earnings Sequences Included in Choice List $C_{\mathrm{CL}}^{\mathrm{UNBAL},\mathrm{I}}$	28
1.B.3	Earnings Sequences Included in Choice List $m{C}_{ ext{CL}}^{ ilde{ ext{UNBAL}}, ext{II}}$	29
2.2.1	Budget Sets $m{C}_{1:1}^{ ext{BAL}, ext{I}}$ and $m{C}_{1:n}^{ ext{UNBAL}, ext{I}}$	39
2.2.2	Budget Sets $C_{1:1}^{ ilde{BAL}, ext{II}}$ and $C_{n:1}^{ ilde{UNBAL}, ext{II}}$	39
2.2.3	Screenshots of a $BAL_{1:1}^{I}$ Decision (Top) and an $UNBAL_{1:8}^{I}$ Decision	
	(Bottom)	40
2.B.1	Earnings Sequences Included in Choice List $oldsymbol{C}_{ ext{CL}}^{ ext{BAL}}$	57
2.B.2	Earnings Sequences Included in Choice List $C_{\text{CL}}^{\text{UNBAL}, I}$ Earnings Sequences Included in Choice List $C_{\text{CL}}^{\text{UNBAL}, II}$	58
2.B.3	Earnings Sequences Included in Choice List $C_{\rm CL}^{ m UNBAL,II}$	59

List of Tables

1	Characters contained in the serii font: Acharter-11r	
2	Characters contained in the sans-serif font: FiraSans-TLF	3
1.1	An Example Table	18
1.2	Points awarded in our typeface competition—basic formatting	22
1.3	Points awarded in our typeface competition—more sophisticated formatting	22
1.C.1	An Example of a Regression Table (Adapted from Gerhardt, Schildberg-Hörisch, and Willrodt, 2017). Never Forget to Mention the De-	
	pendent Variable!	30
1.C.2	Figure Grouping via siunitx in a Table.	30
1.C.3	Overview of the Choice Lists Presented to Subjects (Adapted from Ger-	
	hardt, Schildberg-Hörisch, and Willrodt, 2017).	31
2.3.1	An Example Table	48
2.4.1	Points awarded in our typeface competition—basic formatting	52
2.4.2	Points awarded in our typeface competition—more sophisticated for-	53
2.C.1	matting An Example of a Regression Table (Adapted from Carbordt Sabild	53
2.0.1	An Example of a Regression Table (Adapted from Gerhardt, Schildberg-Hörisch, and Willrodt, 2017). Never Forget to Mention the De-	
	pendent Variable!	60
2.C.2	Figure Grouping via siunitx in a Table.	60
2.C.3	Overview of the Choice Lists Presented to Subjects (Adapted from Ger-	
	hardt, Schildberg-Hörisch, and Willrodt, 2017).	61

Introduction

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

On November 14, 1885, Senator & Mrs. Leland Stanford called together at their San Francisco mansion the 24 prominent men who had been chosen as the first trustees of The Leland Stanford Junior University. They handed to the board the Founding Grant of the University, which they had executed three days before. This document—with various amendments, legislative acts, and court decrees—remains as the University's charter. In bold, sweeping language it stipulates that the objectives of the University are "to qualify students for personal success and direct usefulness in life; and to promote the publick welfare by exercising an influence in behalf of humanity and civilization, teaching the blessings of liberty regulated by law, and inculcating love and reverence for the great principles of government as derived from the inalienable rights of man to life, liberty, and the pursuit of happiness."

¿But aren't Kafka's Schloß and Æsop's Œuvres often naïve vis-à-vis the dæmonic phœnix's official rôle in fluffy soufflés?

(iTHE DAZED BROWN FOX QUICKLY GAVE 12345-67890 JUMPS!)

Ångelå Beatrice Claire Diana Érica Françoise Ginette Hélène Iris Jackie Kāren Łaura María Nấtałĭe Øctave Pauline Quêneau Roxanne Sabine Tãja Uršula Vivian Wendy Xanthippe Yvønne Zäzilie

Let us cite some publications: Andersen, Harrison, Lau, and Rutström (2008), Andreoni and Sprenger (2012), Kőszegi and Szeidl (2013), and Balakrishnan, Haushofer, and Jakiela (2016). With the options set for BibLaTeX in the preamble, citations in the body text are automatically sorted chronologically—irrespective of

 Table 1. Characters contained in the serif font: XCharter-TLF

	<i>'</i> 0	1	2	<i>'</i> 3	′4	<i>'</i> 5	6	7	
′00x	` 0	, 1	^ 2	~ 3	 4	" 5	• 6	v 7	
′01x	8	- 9	10	11 د	, 12	, 13	< 14	> 15	″0x
′02x	" 16	" ₁₇	,, 18	« 19	» 20	- 21	 22	23	,,
′03x	0 24	1 25] 26	ff 27	fi 28	fl 29	ffi 30	ffl 31	″1x
′04x	_ 32	! 33	" 34	# 35	\$ 36	% 37	& 38	, 39	" •
′05x	(40) 41	* 42	+ 43	, 44	- 45	. 46	/ 47	″2x
′06x	0 48	1 49	2 50	3 51	4 52	5 53	6 54	7 55	″ ⊃
′07x	8 56	9 57	: 58	; 59	< 60	= 61	> 62	? 63	″3x
′10x	@ 64	A 65	B 66	C 67	D 68	E 69	F 70	G 71	// /
′11x	H 72	I 73	J 74	K 75	L 76	M 77	N 78	O 79	″4x
′12x	P 80	Q 81	R 82	S 83	T 84	U 85	V 86	W 87	″5x
′13x	X 88	Y 89	Z 90	91	\ 92] 93	^ ₉₄	_ 95	ЭХ
′14x	6 96	a 97	b 98	C 99	d 100	e 101	f 102	g 103	″6x
′15x	h 104	i 105	j 106	k 107	1 108	m 109	n 110	O 111	OX
′16x	p 112	q 113	r 114	S 115	t 116	u 117	V 118	W 119	″7x
′1 <i>7x</i>	X 120	y 121	Z 122	{ 123	124	} 125	~ 126	- 127	/ X
′20x	Ă 128	Ą 129	Ć 130	Č 131	Ď 132	Ě 133	Ę 134	Ğ 135	" 0
′21x	Ĺ 136	Ľ 137	Ł 138	Ń 139	Ň 140	N 141	Ő 142	Ŕ 143	″8x
′22x	Ř 144	Ś 145	Š 146	Ş 147	Ť 148	T 149	Ű 150	Ů 151	″9x
′23x	Ÿ 152	Ź 153	Ž 154	Ż 155	IJ 156	İ 157	đ 158	§ 159	ЭХ
′24x	ă 160	ą 161	ć 162	č 163	ď 164	ě 165	ę 166	ğ 167	″Ax
′25x	Í 168	ľ 169	ł 170	ń 171	ň 172	ŋ 173	ő 174	ŕ 175	AX
′26x	ř 176	Ś 177	Š 178	Ş 179	ť 180	ţ 181	ű 182	ů 183	″Bx
′27x	ÿ 184	Ź 185	Ž 186	Ż 187	ij 188	189	¿ 190	£ 191	DX
′30x	À 192	Á 193	194	à 195	Ä 196	Å 197	Æ 198	Ç 199	″Cx
′31x	È 200	É 201	Ê 202	Ë 203	Ì 204	Í 205	Î 206	Ϊ 207	CX
′32x	Đ 208	Ñ 209	Ò 210	Ó 211	Ô 212	Õ 213	Ö 214	Œ 215	″Dx
′33x	Ø 216	Ù 217	Ú 218	Û 219	Ü 220	Ý 221	Þ 222	SS 223	DX
′34x	à 224	á 225	â 226	ã 227	ä 228	å 229	æ 230	Ç 231	″Ex
′35x	è 232	é 233	ê 234	ë 235	ì 236	í 237	î 238	ï 239	ΕX
′36x	ð 240	ñ 241	Ò 242	ó 243	ô 244	Õ 245	Ö 246	œ 247	″Fx
′37x	Ø 248	ù 249	ú 250	û 251	ü 252	ý 253	þ 254	ß 255	ΓX
	″8	″9	″A	″B	″C	″D	″E	″F	

the order of the "citekeys" in your input. Of course, entries are sorted alphabetically by author surname in the list of references.

Table 2. Characters contained in the sans-serif font: FiraSans-TLF

I	/0	/-	l (o	/0	l	l /-	10	/	I
	0	′1	2	<i>'</i> 3	′4	<i>'</i> 5	6	7	
'00x	0	1	2	~ 3	4	" 5	6	7	″0x
′01х	8	9	10	s ¹¹	c 12	, 13	〈 14	> 15	07
'02x	" 16	" 17	" 18	« 19	» 20	- 21	- 22	23	″1x
′03x	ff 24	l 25	J 26	ffi 27	fi 28	fl 29	ffl 30	fj 31	
'04x	32	! 33	" 34	# 35	\$ 36	% 37	& 38	39	″2x
′05x	(40) 41	* 42	+ 43	, 44	- 45	• 46	/ 47	
′06x	0 48	1 49	2 50	3 51	4 52	5 53	6 54	7 55	″3x
′07x	8 56	9 57	: 58	; 59	< ₆₀	= 61	> 62	? 63	37
′10x	@ 64	A 65	B 66	C 67	D 68	E 69	F 70	G 71	″4X
′11x	H 72	l 73	J 74	K 75	L 76	M 77	N 78	O 79	4 X
′12x	P 80	Q 81	R 82	S 83	T 84	U 85	V 86	W 87	″5x
′13x	X 88	Y 89	Z 90	91	1 92] 93	^ 94	_ 95	37
′14x	96	a 97	b 98	C 99	d 100	e 101	f 102	g 103	″6x
′15x	h 104	i 105	j 106	k 107	l 108	m 109	n 110	0 111	O X
′16x	p 112	q 113	r 114	S 115	t 116	U 117	V 118	W 119	″7x
′17x	X 120	y 121	Z 122	{ 123	124	} 125	~ 126	- 127	/ /
′20x	Ă 128	A 129	Ć 130	Č 131	Ď 132	Ě 133	Ę 134	Ğ 135	″8x
′21x	Ĺ 136	Ľ 137	Ł 138	Ń 139	Ň 140	Ŋ 141	Ő 142	Ŕ 143	σx
′22x	Ř 144	Ś 145	Š 146	Ş 147	Ť 148	Ţ 149	Ű 150	Ů 151	″9x
′23x	Ÿ 152	Ź 153	Ž 154	Ż 155	IJ 156	i 157	đ 158	§ 159	27
′24x	ă 160	ą 161	Ć 162	Č 163	d ′ 164	ě 165	ę 166	ğ 167	″Ax
′25x	[168	[169	ł 170	ń 171	ň 172	ŋ 173	ő 174	ŕ 175	AA
′26x	ř 176	Ś 177	Š 178	Ş 179	ť 180	ţ 181	ű 182	ů 183	″Dv
′27x	ÿ 184	Ź 185	Ž 186	Ż 187	ij 188	189	¿ 190	£ 191	"Bx
′30x	À 192	Á 193	Â 194	Ã 195	Ä 196	Å 197	Æ 198	Ç 199	″Cx
′31x	È 200	É 201	Ê 202	Ë 203	Ì 204	1 205	Î 206	Ϊ 207	CX
′32x	Đ 208	Ñ 209	Ò 210	Ó 211	Ô 212	Õ 213	Ö 214	Œ 215	″Dx
′33x	Ø 216	Ù 217	Ú 218	Û 219	Ü 220	Ý 221	Þ 222	SS 223	DX
′34x	à 224	á 225	â 226	ã 227	ä 228	å 229	æ 230	Ç 231	″Ex
′35x	è 232	é 233	ê 234	ë 235	ì 236	Î 237	Î 238	Ï 239	LX
′36x	ð 240	ñ ₂₄₁	Ò 242	Ó 243	Ô 244	Õ 245	Ö 246	œ 247	″Fx
′37x	Ø 248	ù 249	Ú 250	û 251	ü 252	ý 253	þ 254	ß 255	1. Y
	″8	″9	″A	″B	″C	″D	″E	″F	

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will

4 | Introduction

get no information $E=mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

References

- Andersen, Steffen, Glenn W. Harrison, Morten I. Lau, and E. Elisabet Rutström. 2008. "Eliciting Risk and Time Preferences." *Econometrica* 76 (3): 583–618. DOI: 10.1111/j.1468-0262.2008. 00848.x. [1]
- Andreoni, James, and Charles Sprenger. 2012. "Estimating Time Preferences from Convex Budgets." *American Economic Review* 102 (7): 3333–56. DOI: 10.1257/aer.102.7.3333. [1]
- Balakrishnan, Uttara, Johannes Haushofer, and Pamela Jakiela. 2016. "How Soon Is Now? Evidence of Present Bias from Convex Time Budget Experiments." IZA Discussion Paper. URL: http://ftp.iza.org/dp9653.pdf. [1]
- **Kőszegi, Botond, and Adam Szeidl.** 2013. "A Model of Focusing in Economic Choice." *Quarterly Journal of Economics* 128 (1): 53–104. DOI: 10.1093/qje/qjs049. [1]

Chapter 1

My Job Market Paper*

1.1 Introduction

"Most people can save a few dollars a day or even \$10 a day," she said. "That's doable. But if you say, 'Can you save \$300 a month or a couple of thousand dollars a year?' people will say, 'Whoa.' Avoiding that 'whoa,' which is the hesitancy that can derail planning, is what consultants like Ms. Davidson are trying to do."

-New York Times, March 27, 2016

This template uses the Charter typeface for the body text. Charter is a serif typeface and was designed in 1987 by Matthew Carter. By contrast, all headings, tables, and captions are set in a sans-serif typeface. The sans-serif typeface used in this document is Fira Sans, designed by Erik Spiekermann and collaborators.

The math settings are adjusted in the preamble to the effect that mathematical formulas are automatically typeset in the same font as the surrounding text. That is, math in a serif environment will be set in a serif font, while math in a sans-serif environment will use the sans-serif font. This is an aesthetic choice that may not please everyone given that a sans-serif font may be used in mathematical formulas to express a particular meaning. These cases, however, are very rare.

Let us cite some publications: Andersen, Harrison, Lau, and Rutström (2008), Andreoni and Sprenger (2012), Kőszegi and Szeidl (2013), and Balakrishnan, Haushofer, and Jakiela (2016). With the options set for BibLaTeX in the preamble, citations in the body text are automatically sorted chronologically—irrespective of the order of the "citekeys" in your input. Of course, entries are sorted alphabetically by author surname in the list of references.

This is the second paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text,

^{*} This footnote can be used for acknowledgments. This is where you can express your gratitude to referees, editors, and colleagues for their valuable feedback and suggestions that helped improve your manuscript. Financial support by third parties can also be mentioned here.

you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

After this fourth paragraph, we start a new paragraph sequence. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

Some more references: See Sims (2003) and Gabaix (2014) for models of "rational inattention" or "goal-driven attention." See Bordalo, Gennaioli, and Shleifer (2012), Bordalo, Gennaioli, and Shleifer (2013), Kőszegi and Szeidl (2013), Taubinsky (2014), and Bushong, Rabin, and Schwartzstein (2016) for models of "stimulus-driven attention."

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

This is the second paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like

"Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

In Section 2.2, we describe the design of our study. We present the data analysis and our results in Section 2.3. In Section 2.4, we discuss the plausibility of potential alternative explanations. Section 2.5 concludes.

1.2 Methods

In this section, we first present the design of the experiment (2.2.1) and derive behavioral predictions (2.2.2).

1.2.1 Design of the Main Experiment

1.2.1.1 General Features

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

1.2.1.2 More Specific Features

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

Let's test the euro symbol: €1,234.56. Let's also test text superscripts: i^{th} and text subscripts: CO_2 and CO_2 . Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n}b$. Let's test the footnote settings.

Figure 2.2.3 shows an exemplary decision screen with B = €11 and $r \approx 15\%$ for both BAL $_{1:1}^{I}$ (upper panel) and UNBAL $_{1:8}^{I}$ (lower panel). Through a slider, subjects choose their preferred $x \in X$. The slider position in Figure 2.2.3 indicates x = 0.5, i.e., the earliest payment is reduced by €5.50. Since $r \approx 15\%$ in this example, this slider position amounts to €6.30 that are paid at later payment dates. While these €6.30 are paid in a single bank transfer on the latest payment date in BAL $_{1:1}^{I}$, the amount is dispersed in equal parts over the last 8 payment dates in UNBAL $_{1:8}^{I}$ —i.e., 8 consecutive payments of €0.79.3

- 1. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.
- 2. The slider had no initial position—it appeared only after subjects first positioned the mouse cursor over the slider bar. This was done to avoid default effects.
- 3. We always rounded the second decimal place up so that the sum of the payments included in a dispersed payoff was always at least as great as the respective concentrated payoff.

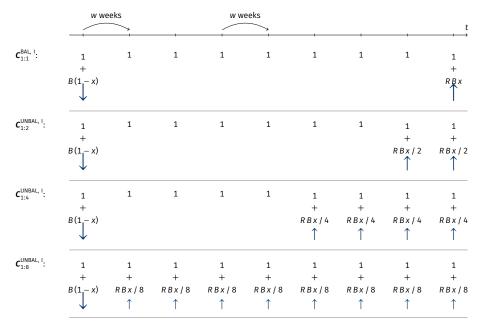


Figure 1.1. Budget Sets $\mathbf{C}_{1:1}^{\text{BAL, I}}$ and $\mathbf{C}_{1:n}^{\text{UNBAL, I}}$

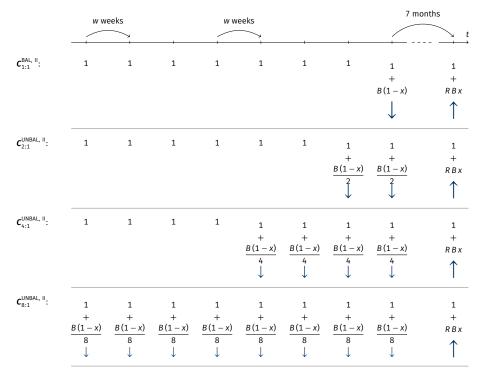


Figure 1.2. Budget Sets $m{C}_{1:1}^{\mathrm{BAL,\;II}}$ and $m{C}_{n:1}^{\mathrm{UNBAL,\;II}}$

Notes: For the values of *B*, *R*, and *w* that we used, see Section 2.2.1.4. The savings rate *x* is individuals' choice variable: they choose some $x \in \mathbf{X} = \{0, \frac{1}{100}, \frac{2}{100}, \dots, 1\}$ in each trial. The arrows indicate whether and in which direction payments at the respective payment dates change if *x* is increased. This figure was taken from Dertwinkel-Kalt, Gerhardt, Riener, Schwerter, and Strang (2017).

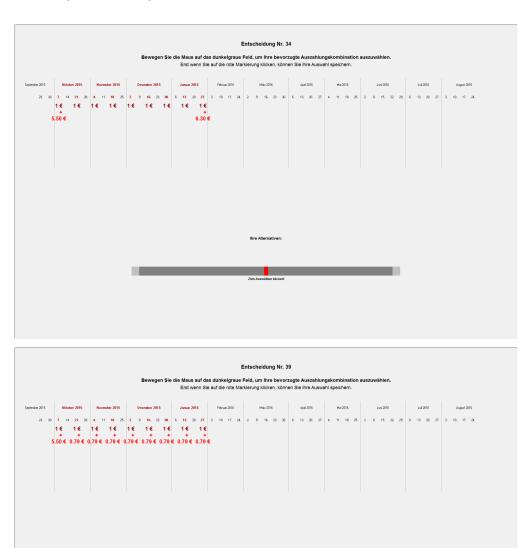


Figure 1.3. Screenshots of a $BAL_{1:1}^{l}$ Decision (Top) and an $UNBAL_{1:8}^{l}$ Decision (Bottom)

Note: This figure was taken from Dertwinkel-Kalt et al. (2017).

1.2.1.3 Some More Details

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A

blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

Here's a bulleted list:

- Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.
- Hello, here is some text without a meaning. $d\Omega = \sin\vartheta d\vartheta d\varphi$. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sin^2(\alpha) + \cos^2(\beta) = 1$. This text should contain *all letters of the alphabet* and it should be written in of the original language $E = mc^2$. There is no need for special contents, but the length of words should match the language. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$.
- Hello, here is some text without a meaning. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. This text should show what a printed text will look like at this place. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. If you read this text, you will get no information. $d\Omega = \sin\vartheta d\vartheta d\varphi$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. $\sin^2(\alpha) + \cos^2(\beta) = 1$.

1.2.1.4 Procedure

Describe the sequence of events in your study. You could do this with the help of an enumerated list:

1. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you

will get no information $E=mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

- 2. Hello, here is some text without a meaning. $d\Omega = \sin \vartheta d\vartheta d\varphi$. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sin^2(\alpha) + \cos^2(\beta) = 1$. This text should contain *all letters of the alphabet* and it should be written in of the original language $E = mc^2$. There is no need for special contents, but the length of words should match the language. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$.
- 3. Hello, here is some text without a meaning. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. This text should show what a printed text will look like at this place. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. If you read this text, you will get no information. $d\Omega = \sin\vartheta d\vartheta d\varphi$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. $\sin^2(\alpha) + \cos^2(\beta) = 1$.

1.2.2 Predictions

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two

pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages.4

4. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift - not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift - not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information?

By discounted utility we understand any intertemporal utility function that is time-separable and that values a payment farther in the future at most as much as an equal-sized payment closer in the future. Importantly, the predictions derived below hold for all three frequently used types of discounting—exponential, hyperbolic, and quasi-hyperbolic.

In the following, we assume that individuals base their decisions on utility derived from receiving monetary payments c_t at various dates t. This is an assumption that is frequently made in experiments on intertemporal decision making. One way to justify this assumption is that individuals anticipate to consume the payments they receive within a short period around date t. Given that the maximum payment was below €20 and that any two payment dates were separated by at least two weeks, this assumption seems reasonable (see the arguments in favor of this view in Halevy, 2014). Kőszegi and Szeidl (2013) themselves make the same assumption of "money in the utility function": "in some applications we also assume that monetary transactions induce direct utility consequences, so that for instance an agent making a payment experiences an immediate utility loss. The idea that people experience monetary transactions as immediate utility is both intuitively compelling and supported in the literature: ... some evidence on individuals' attitudes toward money, such as narrow bracketing (...) and laboratory evidence on hyperbolic discounting (...), is difficult to explain without it." Last but not least, the papers by McClure, Laibson, Loewenstein, and Cohen (2004) and McClure, Ericson, Laibson, Loewenstein, and Cohen (2007) demonstrate that brain activation, as measured by functional magnetic resonance imaging, is similar for primary and monetary rewards. Additionally, we make the standard assumption that utility from money is increasing in its argument but not convex: $u'(c_t) \ge 0$ and $u''(c_t) \le 0$.

1.2.2.1 Discounted Utility

Individuals make their allocation decisions by comparing the aggregated consumption utility of each earnings sequence $c \in C$. Discounted utility assumes that the utility of each period enters overall utility additively. That is, utility derived from the payment to be received at future date t can be expressed as $u_t(c_t) := D(t) u(c_t)$. Here, D(t) denotes the individual's discount function for conversion of future utility into present utility. The discount function satisfies $0 \le D(t)$ and $D'(t) \le 0$, such that

Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

a payment further in the future is valued at most as much as an equal-sized payment closer in the future.⁵

The utility of earnings sequence c with payments c_t in periods t = 1, ..., T is

$$U(\mathbf{c}) = \sum_{t=1}^{T} u_t(c_t) = \sum_{t=1}^{T} D(t) u(c_t).$$
 (1.1)

Individuals choose how much to allocate to the different periods by maximizing their utility over all possible earnings sequences available within a given budget set C, see equation (2.2.1). We use the superscript $^{\mathrm{DU}}$ to indicate decisions based on discounted utility.

A Subparagraph. After this fourth paragraph, we start a new paragraph sequence. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

Another Subparagraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

^{5.} Normalization such that $D(t) \le 1$ is not necessary in our case. Provided that t is a metric time measure, where t = 0 stands for the present, examples are $D(t) := \delta^t$ with some $\delta > 0$ for exponential discounting and $D(t) := (1 + \alpha t)^{-\gamma/\alpha}$ with some $\alpha, \gamma > 0$ for generalized hyperbolic discounting.

1.2.2.2 Focus-Weighted Utility

In this section, we extend the model of discounted utility through "focus weights," as proposed by Kőszegi and Szeidl (2013). Period-t weights g_t scale period-t consumption utility u_t . Individuals are assumed to maximize focus-weighted utility, which is defined as follows:

$$\tilde{U}(\boldsymbol{c},\boldsymbol{C}) := \sum_{t=1}^{T} g_t(\boldsymbol{C}) u_t(c_t). \tag{1.2}$$

In contrast to discounted utility U(c), focus-weighted utility $\tilde{U}(c, C)$ has two arguments: the earnings sequence c and the choice set C. The latter dependence is due to the weights g_t . These are given by a strictly increasing weighting function g that takes as its argument the difference between the maximum and the minimum attainable utility in period t over all possible earnings sequences in set C:

$$g_t(\mathbf{C}) := g[\Delta_t(\mathbf{C})] \text{ with } \Delta_t(\mathbf{C}) := \max_{c \in C} u_t(c_t) - \min_{c \in C} u_t(c_t).$$
 (1.3)

If the underlying consumption utility function is characterized by discounted utility, then $u_t(c_t) := D(t) u(c_t)$. That is, focused thinkers put more weight on period t than on period t' if the discounted-utility distance between the best and worst alternative is larger for period t than for period t'.

A Subparagraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

Yet Another Subparagraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

1.2.2.3 Hypotheses

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will

get no information $E=mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. This gives rise to our first hypothesis:

Hypothesis 1. This environment can be used to clearly state your hypothesis and set them apart from the body text.

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. Based on this, we can state our second hypothesis:

Hypothesis 2. This environment can be used to clearly state your hypothesis and set them apart from the body text.

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

1.3 Results

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. With this, we can test our hypotheses.

Table 1.1. An Example Table

Dependent variable	â
Estimate	0.123*** (0.011)
Observations Subjects	750 250

Notes: Standard errors in parentheses, clustered on the subject level. * p < 0.10, ** p < 0.05, *** p < 0.01.

1.3.1 Test of Hypothesis 3

Our first result supports Hypothesis 3. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. The analysis we conducted to obtain Result 3 is described in detail in Table 2.3.1. Let's reference a section, a subsection, and a figure from the appendices: Section 2.C, Section 2.A.2, Figure 2.B.1.

Result 1. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n}b$.

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$

There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

1.3.2 Test of Hypothesis 4

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. We thereby test Hypothesis 4.

Result 2. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

Our second result provides evidence in support of Hypothesis 4. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

1.3.3 Heterogeneity

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a}$

There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

$$\bar{x} = \frac{1}{n} \sum_{i=1}^{i=n} x_i = \frac{x_1 + x_2 + \dots + x_n}{n}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

$$\int_0^\infty e^{-\alpha x^2} dx = \frac{1}{2} \sqrt{\int_{-\infty}^\infty e^{-\alpha x^2}} dx \int_{-\infty}^\infty e^{-\alpha y^2} dy = \frac{1}{2} \sqrt{\frac{\pi}{\alpha}}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

$$\sum_{k=0}^{\infty} a_0 q^k = \lim_{n \to \infty} \sum_{k=0}^n a_0 q^k = \lim_{n \to \infty} a_0 \frac{1 - q^{n+1}}{1 - q} = \frac{a_0}{1 - q}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n}b$.

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-p \pm \sqrt{p^2 - 4q}}{2}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift - not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all* letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

$$\frac{\partial^2 \Phi}{\partial x^2} + \frac{\partial^2 \Phi}{\partial y^2} + \frac{\partial^2 \Phi}{\partial z^2} = \frac{1}{c^2} \frac{\partial^2 \Phi}{\partial t^2}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift - not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

1.3.4 Structural Estimation

This is the second paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift - not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

$$\Sigma := \operatorname{Cov}(X) = \begin{bmatrix} \operatorname{Var}(X_1) & \cdots & \operatorname{Cov}(X_1, X_n) \\ \vdots & \ddots & \vdots \\ \operatorname{Cov}(X_n, X_1) & \cdots & \operatorname{Var}(X_n) \end{bmatrix}$$

Discussion

1.4.1 Some Limitations

Let's reference some tables: Table 2.4.1 and Table 2.4.2. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place.

Table 1.2. Points awarded in our typeface competition—basic formatting

	Utopia	Computer Modern	Charter	Times Roman	Palatino
Yoël	1	1	2	0	1
Çelik	2	0	2	1	0
Anità	1	2	1	2	0
Uğur	1	2	0	1	0
Håkan	1	0	2	0	1
Allison	2	0	1	2	1
Pía	1	0	2	1	0
David	1	0	2	1	1
Sum	10	5	12	8	4

If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

Table 1.3. Points awarded in our typeface competition—more sophisticated formatting

	Utopia ^a	Computer Modern ^b	Charter ^c	Times Roman ^d	Palatino ^e
Yoël	1	1	2	0	1
Çelik	2	0	2	1	0
Anità	1	2	1	2	0
Uğur	1	2	0	1	0
Håkan	1	0	2	0	1
Allison	2	0	1	2	1
Pía	1	0	2	1	0
David	1	0	2	1	1
Sum	10	5	12	8	4

a \usepackage{fourier}

^b The **ET_EX** standard serif font.

c \usepackage[charter]{mathdesign}

d \usepackage{newtxtext, newtxmath}

e \usepackage[sc]{mathpazo}

1.4.2 Utility from Money

In deriving our predictions (Section 2.2.2), we assume that subjects base their decisions on utility derived from receiving monetary payments c_t at various dates t. We also make the standard assumption that utility from money is increasing in its argument but not convex, i.e., $u'(c_t) \ge 0$ and $u''(c_t) \le 0$. Both assumptions are frequently made in studies on intertemporal decision making.

One way to justify the assumption of utility being based on money—rather than consumption—is that individuals anticipate to consume the payments that they receive at date t within a short period around t. Given that the maximum payment was below €20 and that any two payment dates were separated by at least two weeks, this seems reasonable (see the arguments in favor of this view in Halevy, 2014).

A second justification is consistency within the discipline: Halevy (2014) points out that "in the domain of risk and uncertainty ... preferences are often defined over payments." In line with this, Kőszegi and Szeidl (2013, p. 62) make the same assumption of "money in the utility function":

in some applications we also assume that monetary transactions induce direct utility consequences, so that for instance an agent making a payment experiences an immediate utility loss. The idea that people experience monetary transactions as immediate utility is both intuitively compelling and supported in the literature: ... some evidence on individuals' attitudes toward money, such as narrow bracketing (...) and laboratory evidence on hyperbolic discounting (...), is difficult to explain without it.

Last but not least, the papers by McClure, Laibson, et al. (2004) and McClure, Ericson, et al. (2007) demonstrate that brain activation, as measured by functional magnetic resonance imaging, is similar for primary and monetary rewards.

Let us now discuss the second assumption: that utility from money is nonconvex. We find that subjects allocate more money to the concentrated payoffs in the unbalanced than in the associated balanced budget sets—which we call concentration bias. One might argue that this relative preference for concentrated payoffs can be explained by the per-period utility function over money being convex.

Obtaining evidence on the shape of utility over money is nontrivial because it requires that at least two monetary amounts be compared with each other without the one clearly dominating the other. Thus, estimates of the curvature of the utility function over money can be obtained in two ways: the monetary amounts must be paid in different states of the world, i.e., comprise a lottery, or they have to be paid at different points in time. 6 Both methods entail particular theoretical assumptions.

^{6.} As a matter of fact, the latter was the motivation behind Samuelson (1937): "Under the following four assumptions, it is believed possible to arrive theoretically at a precise measure of the marginal utility of money income ..." (p. 155; emphasis in the original).

Andersen et al. (2008) advocate the former approach and argue that when estimating time preference parameters, one should control for the curvature of the utility function through a measure of the curvature that is based on observed choices under risk. Their study and numerous other studies on risk attitudes consistently reveal that the vast majority of subjects is risk-averse even over small stakes. Hence, for the vast majority of subjects, utility over money is concave according to this methodology (ruling out probability weighting). Others, most notably Andreoni and Sprenger (2012), have argued that the degree of curvature measured via risky choices probably overstates the degree of curvature effective in intertemporal choices, but they also find that utility is concave (albeit close to linear). Given this unambiguous evidence from previous studies, it is implausible that our subjects exhibit convex utility over money.

1.5 Conclusion

Cite some more papers (Yaari, 1965; Warner and Pleeter, 2001; Davidoff, Brown, and Diamond, 2005; Benartzi, Previtero, and Thaler, 2011). Let's cite a book: Luce (1959). Let's cite a contribution to a collected volume: Harrison and Rutström (2008) and a collection (an edited volume) itself: Kagel and Roth (2016). Now let's cite presentations at conferences: Vosgerau, Bruyneel, Dhar, and Wertenbroch (2008) and Beute and Kort (2012). Attema, Bleichrodt, Gao, Huang, and Wakker (2016) propose a method for "measuring discounting without measuring utility".

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

Appendix 1.A Put More Complicated Derivations and Proofs Here

1.A.1 Appendix Subsection

And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at

^{7.} The basic idea of their method is intriguingly simple: Imagine an individual who is indifferent between, say, Option A: \$10 today and Option B: \$10 in one year plus \$10 in two years. With a constant annual discount factor δ , this indifference translates to $u(\$10) = \delta u(\$10) + \delta^2 u(\$10)$, so that u(\$10) cancels out, and δ can be readily calculated as the solution to $1 = \delta + \delta^2$.

this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift - not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

- 1. Erster Listenpunkt, Stufe 1
 - a. Erster Listenpunkt, Stufe 2
 - i. Erster Listenpunkt, Stufe 3
 - ii. Zweiter Listenpunkt, Stufe 3
 - iii. Dritter Listenpunkt, Stufe 3
 - iv. Vierter Listenpunkt, Stufe 3
 - b. Zweiter Listenpunkt, Stufe 2
 - c. Dritter Listenpunkt, Stufe 2
 - d. Vierter Listenpunkt, Stufe 2
- 2. Zweiter Listenpunkt, Stufe 1
- 3. Dritter Listenpunkt, Stufe 1
- 4. Vierter Listenpunkt, Stufe 1

The typeset math below follows the ISO recommendations that only variables be set in italic. Note the use of upright shapes for "d," "e," and " π ." (These are entered as \mathup{d}, \mathup{e}, and \mathup{\pi}, respectively.)

Theorem 1 (Simplest form of the Central Limit Theorem). Let X_1, X_2, \cdots be a sequence of i.i.d. random variables with mean 0 and variance 1 on a probability space $(\Omega, \mathcal{F}, \mathbb{P})$. Then

$$\mathbb{P}\left(\frac{X_1 + \dots + X_n}{\sqrt{n}} \le y\right) \to \mathfrak{N}(y) := \int_{-\infty}^{y} \frac{e^{-\nu^2/2}}{\sqrt{2\pi}} d\nu \quad as \ n \to \infty,$$

or, equivalently, letting $S_n := \sum_{1}^{n} X_k$,

$$\mathbb{E} f \left(S_n / \sqrt{n} \right) \to \int_{-\infty}^{\infty} f(v) \frac{\mathrm{e}^{-v^2/2}}{\sqrt{2\pi}} \, \mathrm{d}v \quad \text{as } n \to \infty, \text{ for every } f \in \mathrm{b} \mathscr{C}(\mathbb{R}).$$

1.A.2 Salience

Salience theory (Bordalo, Gennaioli, and Shleifer, 2012, 2013) represents a behavioral model according to which the most distinctive features of the available alternatives receive a particularly large share of attention and are therefore over-weighted. More precisely, a particular attribute out of all attributes of an alternative becomes the more salient, the more it differs from that attribute's average level over all available alternatives.

Formally, alternatives are assumed to be uniquely characterized by the values they take in $T \ge 1$ attributes (or, "dimensions"). Utility is assumed to be additively separable in attributes, and salience attaches a decision weight to each attribute of each good which indicates how salient the respective attribute is for that good. Suppose an agent chooses one alternative from some finite choice set C. Let t index the T different attributes, and let t index the t available alternatives. Let t index the function which assigns utility to values in dimension t. Denote by t the level of attribute t of good t and define t in t as the utility that dimension t of good t yields. Let t be the average utility level, across all t goods, of dimension t. The salience of each dimension of good t is determined by a symmetric and continuous salience function t0. That satisfies the following two properties:

1. Ordering. Let $\mu := \operatorname{sgn}(u_t^k - \overline{u}_t)$. Then for any $\epsilon, \epsilon' \ge 0$ with $\epsilon + \epsilon' > 0$, it holds that

$$\sigma(u_t^k + \mu \epsilon, \overline{u}_t - \mu \epsilon') > \sigma(u_t^k, \overline{u}_t). \tag{1.A.1}$$

2. Diminishing sensitivity. For any $u_t^k, \overline{u}_t \ge 0$ and all $\epsilon > 0$, it holds that

$$\sigma(u_t^k + \epsilon, \overline{u}_t + \epsilon) < \sigma(u_t^k, \overline{u}_t). \tag{1.A.2}$$

Following the smooth salience characterization proposed in Bordalo, Gennaioli, and Shleifer (2012, p. 1255), each dimension t of good k receives weight $\Delta^{-\sigma(u_t^k, \bar{u}_t)}$, where $\Delta \in (0,1]$ is a constant that captures an agent's susceptibility to salience. $\Delta = 1$ gives rise to a rational decision maker, and the smaller Δ , the stronger is the salience bias. We call an agent with $\Delta < 1$ a salient thinker.

A reference with a large number of authors is Henrich, Boyd, Bowles, Camerer, Fehr, et al. (2005).

Appendix 1.B Some Additional Figures

	w we	eeks					w w	eeks	
			i						
c _{CL} ^{BAL} (1):	1 + B	1	1	1	1	1	1	1	$\longrightarrow \longmapsto t$ 1
c _{CL} ^{BAL} (2):	1	1 + B+i	1	1	1	1	1	1	1
c _{CL} (3):	1	1	1 + B + 2i	1	1	1	1	1	1
c _{CL} ^{BAL} (4):	1	1	1	1 + B + 3i	1	1	1	1	1
c _{CL} ^{BAL} (5):	1	1	1	1	1 + B + 4i	1	1	1	1
c _{CL} (6):	1	1	1	1	1	1 + B + 5i	1	1	1
c _{CL} (7):	1	1	1	1	1	1	1 + B + 6 <i>i</i>	1	1
c _{CL} (8):	1	1	1	1	1	1	1	1 + B + 7i	1
c _{CL} ^{BAL} (9):	1	1	1	1	1	1	1	1	1 + B + 8i

Figure 1.B.1. Earnings Sequences Included in Choice List $\mathbf{C}_{\text{CL}}^{\text{BAL}}$

Notes: For the values of B, i, and w that we used see Section 2.2. Figure taken from Dertwinkel-Kalt et al. (2017).

	w w	eeks					w we	eeks	
			+	+	+	+		<u></u>	\longrightarrow t
c _{CL} ^{UNBAL, I} (1):	1 + B	1	1	1	1	1	1	1	1
c _{CL} ^{UNBAL, I} (2):	1 B+i 2	‡ <u>B+i</u> 2	1	1	1	1	1	1	1
c _{CL} ^{UNBAL, I} (3):	‡ B+2i 3	$\frac{1}{\frac{B+2i}{3}}$	$\frac{1}{4}$ $\frac{B+2i}{3}$	1	1	1	1	1	1
c _{CL} ^{UNBAL, I} (4):	1 B+3i 4	‡ <u>B+3i</u> 4	‡ <u>B+3i</u> 4	1 B+3i 4	1	1	1	1	1
c _{CL} ^{UNBAL, I} (5):	1 <u>B+4i</u> 5	1 <u>B+4i</u> 5	1 <u>B+4i</u> 5	1 <u>B+4i</u> 5	1 <u>B+4i</u> 5	1	1	1	1
c _{CL} ^{UNBAL, I} (6):	1 <u>B+5i</u> 6	1 <u>B+5i</u> 6	1 B+5i 6	1 <u>B+5i</u> 6	1 + <u>B+5i</u> 6	‡ <u>B+5i</u> 6	1	1	1
c _{CL} ^{UNBAL, I} (7):	1 B+6i 7	‡ <u>B+6i</u> 7	1 B+6i 7	1 B+6i 7	1 <u>B+6i</u> 7	‡ <u>B+6i</u> 7	‡ <u>B+6i</u> 7	1	1
c _{CL} ^{UNBAL, I} (8):	‡ <u>B+7i</u> 8	‡ <u>B+7i</u> 8	‡ <u>B+7i</u> 8	‡ <u>B+7i</u> 8	1 <u>B+7i</u> 8	‡ <u>B+7i</u> 8	‡ <u>B+7i</u> 8	‡ <u>B+7i</u> 8	1
c _{CL} ^{UNBAL, I} (9):	1 <u>B+8i</u> 9	1 <u>B+8i</u> 9	‡ <u>B+8i</u> 9	1 <u>+</u> <u>B+8i</u> 9	1 <u>B+8i</u> 9	‡ <u>B+8i</u> 9	‡ <u>B+8i</u> 9	‡ <u>B+8i</u> 9	1 <u>B+8i</u> 9

Figure 1.B.2. Earnings Sequences Included in Choice List $\mathbf{C}_{\mathsf{CL}}^{\mathsf{UNBAL},\mathsf{I}}$

Notes: For the values of B, i, and w that we used see Section 2.2. Figure taken from Dertwinkel-Kalt et al. (2017).

	W W	reeks					w we	eeks	
c _{CL} ^{UNBAL, II} (1):	1 1 B 9	1 B 9	1 B B 9	1 B 9	1 B 9	1 B B 9	1 1 B 9	1 B B 9	$ \begin{array}{ccc} & & \downarrow & \downarrow \\ & & \downarrow & \downarrow \\ & & \downarrow & \downarrow \\ & & \downarrow & \downarrow & \downarrow \\ & & \downarrow & \downarrow & \downarrow \\ & & \downarrow & \downarrow & \downarrow & \downarrow \\ & & \downarrow & \downarrow & \downarrow & \downarrow \\ & & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & & \downarrow \\ & & \downarrow \\ & & \downarrow \\ & & \downarrow \\ & & \downarrow \\ & & \downarrow \\ & & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & $
c _{CL} ^{UNBAL, II} (2):	1	$\frac{1}{+}$ $\frac{B+i}{8}$	$\frac{1}{\frac{B+i}{8}}$	1 B+i 8	1 B+i 8	$\frac{1}{+}$ $\frac{B+i}{8}$	$\frac{1}{+}$ $\frac{B+i}{8}$	‡ <u>B+i</u> 8	$\frac{1}{+}$ $\frac{B+i}{8}$
c _{CL} ^{UNBAL, II} (3):	1	1	$\frac{1}{+}$ $\frac{B+2i}{7}$	‡ <u>B+2i</u> 7	‡ <u>B+2i</u> 7	‡ B+2i 7	$\begin{array}{c} \frac{1}{+} \\ \frac{B+2i}{7} \end{array}$	1 + B+2i 7	1 B+2i 7
c _{CL} ^{UNBAL, II} (4):	1	1	1	‡ <u>B+3i</u> 6	1 <u>B+3i</u> 6	‡ <u>B+3i</u> 6	‡ <u>B+3i</u> 6	1 <u>B+3i</u> 6	1 B+3i 6
c _{CL} ^{UNBAL, II} (5):	1	1	1	1	1 + <u>B+4i</u> 5	‡ <u>B+4i</u> 5	‡ <u>B+4i</u> 5	1 + <u>B+4i</u> 5	1 B+4i 5
c _{CL} ^{UNBAL, II} (6):	1	1	1	1	1	‡ 8+5i 4	1 <u>B+5i</u> 4	1 + <u>B+5i</u> 4	1 B+5i 4
c _{CL} ^{UNBAL, II} (7):	1	1	1	1	1	1	$\frac{1}{+}$ $\frac{B+6i}{3}$	1 + B+6i 3	1 B+6i 3
c _{CL} ^{UNBAL, II} (8):	1	1	1	1	1	1	1	1 + <u>B+7i</u> 2	$\frac{1}{+}$ $\frac{B+7i}{2}$
c _{CL} ^{UNBAL, II} (9):	1	1	1	1	1	1	1	1	1 + B + 8i

Figure 1.B.3. Earnings Sequences Included in Choice List $\mathbf{C}_{\mathsf{CL}}^{\mathsf{UNBAL},\mathsf{II}}$

Notes: For the values of B, i, and w that we used see Section 2.2. Figure taken from Dertwinkel-Kalt et al. (2017).

Appendix 1.C siunitx Example Tables

Table 1.C.1. An Example of a Regression Table (Adapted from Gerhardt, Schildberg-Hörisch, and Willrodt, 2017). Never Forget to Mention the Dependent Variable!

	(1)	(2)	(3)	(4)	(5)
Treatment	-0.390	-0.228	-0.729*	-0.449*	-0.453**
	(+0.352)	(-0.205)	[+0.377]	[-0.245]	{+0.204 }
Female	0.948***	0.061	0.188	0.305	0.385*
	(0.354)	(0.233)	(0.372)	(0.226)	(0.222)
Female × Treatment	0.169	0.251	0.892*	0.454	0.439
	(0.514)	(0.325)	(0.533)	(0.341)	(0.307)
Final high school grade	-0.101	0.013	0.076	0.117	0.039
	(0.198)	(0.144)	(0.224)	(0.146)	(0.133)
Trait self-control	-0.016	0.002	-0.016	-0.000	-0.007
	(0.016)	(0.010)	(0.015)	(0.010)	(0.009)
Constant	2.357***	1.512***	-0.322	2.158***	1.437***
	(0.239)	(0.144)	(0.265)	(0.161)	(0.152)
Observations	303	289	295	304	1191
R^2	0.057	800.0	0.039	0.043	0.024
Treatment × (1 + Female)	-0.221	0.023	0.163	0.004	-0.014
$p_{\scriptscriptstyle F}[{\sf Treatment} \times$	0.327	0.008	0.192	0.000	0.003
(1 + Female) = 0]					

Notes: Dependent variable: m_{\sim} . Robust standard errors (cluster-corrected for column 5) in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. Missing observations (N < 308) due to exclusion of trials in which subjects behaved irrationally (i.e., chose a dominated option). The regressors Final high school grade and Trait self-control are mean-centered.

Table 1.C.2. Figure Grouping via siunitx in a Table.

(1)	(2)	(3)
-0.100*	-0.100 01*	-123456.444***
(2.871)	(2.871 23)	[+50000.123]

Table 1.C.3. Overview of the Choice Lists Presented to Subjects (Adapted from Gerhardt, Schildberg-Hörisch, and Willrodt, 2017).

		Altern	ative A			Alternative B			
	C _{A,1}	$p_{A,1}$	C _{A,2}	p _{A,2}	C _{B,1}	р _{в,1}	С _{В,2}	р _{в,2}	
Choice List I: $risky/risky$ ($x = £2$)	2.00, r =	€7.50, k	= €11.50;	25 rows)					
Top row	€ 3.00	50%	€22.00	50%	€ 3.00	50%	€ 7.00	50%	
Center row	€ 3.00	50%	€22.00	50%	€ 9.00	50%	€13.00	50%	
Row with $m = 0$	€ 3.00	50%	€22.00	50%	€10.50	50%	€14.50	50%	
Bottom row	€ 3.00	50%	€22.00	50%	€15.00	50%	€19.00	50%	
Choice List II: safe/risky ($x = £1$	6.00, r =	€5.00, k	= €5.00; 1	9 rows)					
Top row	€11.00	100%			€11.00	50%	€21.00	50%	
Center row	€11.00	100%			€ 6.50	50%	€16.50	50%	
Row with $m = 0$	€11.00	100%			€ 6.00	50%	€16.00	50%	
Bottom row	€11.00	100%			€ 2.00	50%	€12.00	50%	
Choice List III: "long shot" ($x = \epsilon$	14.00, r	= -€36.0	00, k = €7.	00; 21 ro	ws)				
Top row	€ 7.00	90%	€50.00	10%	€ 7.00	90%	€10.00	10%	
Row with $m = 0$	€ 7.00	90%	€50.00	10%	€11.00	90%	€14.00	10%	
Center row	€ 7.00	90%	€50.00	10%	€12.00	90%	€15.00	10%	
Bottom row	€ 7.00	90%	€50.00	10%	€17.00	90%	€20.00	10%	
Choice List IV: delayed payoffs (x	x = €18.0	0, r = €6	5.00, <i>k</i> = €8	8.50, paid	d in one wee	k; 20 ro	ws)		
Top row	€ 9.50	50%	€12.00	50%	€ 9.50	50%	€24.00	50%	
Above-center row	€ 9.50	50%	€12.00	50%	€ 5.00	50%	€19.50	50%	
Below-center row	€ 9.50	50%	€12.00	50%	€ 4.50	50%	€19.00	50%	
Row with $m=0$	€ 9.50	50%	€12.00	50%	€ 3.50	50%	€18.00	50%	
Bottom row	€ 9.50	50%	€12.00	50%	€ 0.00	50%	€14.50	50%	

References

- Andersen, Steffen, Glenn W. Harrison, Morten I. Lau, and E. Elisabet Rutström. 2008. "Eliciting Risk and Time Preferences." *Econometrica* 76 (3): 583–618. DOI: 10.1111/j.1468-0262.2008. 00848.x. [5, 24]
- Andreoni, James, and Charles Sprenger. 2012. "Estimating Time Preferences from Convex Budgets." American Economic Review 102 (7): 3333–56. DOI: 10.1257/aer.102.7.3333. [5, 24]
- Attema, Arthur E., Han Bleichrodt, Yu Gao, Zhenxing Huang, and Peter P. Wakker. 2016. "Measuring Discounting without Measuring Utility." *American Economic Review* 106 (6): 1476–94. DOI: 10.1257/aer.20150208. [24]
- Balakrishnan, Uttara, Johannes Haushofer, and Pamela Jakiela. 2016. "How Soon Is Now? Evidence of Present Bias from Convex Time Budget Experiments." IZA Discussion Paper. URL: http://ftp.iza.org/dp9653.pdf. [5]
- Benartzi, Shlomo, Alessandro Previtero, and Richard H. Thaler. 2011. "Annuitization Puzzles." Journal of Economic Perspectives 25 (4): 143–64. DOI: 10.1257/jep.25.4.143. [24]
- Beute, Femke, and Yvonne A. W. de Kort. 2012. "Always Look on the Bright Side of Life: Ego-Replenishing Effects of Daylight versus Artificial Light." In *Proceedings of Experiencing Light 2012: International Conference on the Effects of Light on Wellbeing.* Edited by Y. A. W. de Kort, M. P. J. Aarts, F. Beute, A. Haans, W. A. IJsselsteijn, D. Lakens, K. C. H. J. Smolders, and L. van Rijswijk. Eindhoven University of Technology. Eindhoven, The Netherlands, 1–4. URL: http://2012.experiencinglight.nl/doc/41.pdf. [24]
- Bordalo, Pedro, Nicola Gennaioli, and Andrei Shleifer. 2012. "Salience Theory of Choice Under Risk." *Quarterly Journal of Economics* 127 (3): 1243–85. DOI: 10.1093/qje/qjs018. [6, 26]
- **Bordalo, Pedro, Nicola Gennaioli, and Andrei Shleifer.** 2013. "Salience and Consumer Choice." *Journal of Political Economy* 121(5): 803–43. DOI: 10.1086/673885. [6, 26]
- **Bushong, Benjamin, Matthew Rabin, and Joshua Schwartzstein.** 2016. "A Model of Relative Thinking." Working paper. Cambridge, MA, USA: Harvard University. URL: http://people.hbs.edu/jschwartzstein/RelativeThinking.pdf. [6]
- Davidoff, Thomas, Jeffrey R. Brown, and Peter A. Diamond. 2005. "Annuities and Individual Welfare." American Economic Review 95 (5): 1573–90. DOI: 10.1257/000282805775014281. [24]
- Dertwinkel-Kalt, Markus, Holger Gerhardt, Gerhard Riener, Frederik Schwerter, and Louis Strang. 2017. "Concentration Bias in Intertemporal Choice." Working paper. Bonn, Germany, et al.: University of Bonn et al. URL: https://www.dropbox.com/s/dv20mcu0qkygmjz/Concentration_Bias_in_Intertemporal_Choice.pdf. [9, 10, 27–29]
- **Gabaix, Xavier.** 2014. "A Sparsity-Based Model of Bounded Rationality." *Quarterly Journal of Economics* 129 (4): 1661–710. DOI: 10.1093/qje/qju024. [6]
- Gerhardt, Holger, Hannah Schildberg-Hörisch, and Jana Willrodt. 2017. "Does self-control depletion affect risk attitudes?" *European Economic Review* 100 (November): 463–87. DOI: 10. 1016/j.euroecorev.2017.09.004. [30, 31]
- **Halevy, Yoram.** 2014. "Some Comments on the Use of Monetary and Primary Rewards in the Measurement of Time Preferences." Working paper. University of British Columbia. URL: http://faculty.arts.ubc.ca/yhalevy/monetary_primary.pdf. [14, 23]
- Harrison, Glenn W., and E. Elisabet Rutström. 2008. "Risk Aversion in the Laboratory." In *Risk Aversion in Experiments*. Edited by Glenn W. Harrison and James C. Cox. Vol. 12, Research in Experimental Economics. Bingley, UK: Emerald Group. Chapter 1, 41–196. DOI: 10.1016/S0193-2306(08)00003-3. [24]

- Henrich, Joseph, Robert Boyd, Samuel Bowles, Colin Camerer, Ernst Fehr, Herbert Gintis, Richard McElreath, Michael Alvard, Abigail Barr, Jean Ensminger, Natalie Smith Henrich, Kim Hill, Francisco Gil-White, Michael Gurven, Frank W. Marlowe, John Q. Patton, and David Tracer. 2005. "'Economic man' in cross-cultural perspective: Behavioral experiments in 15 small-scale societies." Behavioral and Brain Sciences 28(6): 795-815, discussion 815-55. DOI: 10.1017/ S0140525X05000142. [26]
- Kagel, John H., and Alvin E. Roth, editors. 2016. The Handbook of Experimental Economics. Vol. 2, Princeton, NJ, USA: Princeton University Press. [24]
- Kőszegi, Botond, and Adam Szeidl. 2013. "A Model of Focusing in Economic Choice." Quarterly Journal of Economics 128 (1): 53-104. DOI: 10.1093/qje/qjs049. [5, 6, 14, 16, 23]
- Luce, R. Duncan. 1959. Individual Choice Behavior: A Theoretical Analysis. New York, NY, USA: John Wiley & Sons. [24]
- McClure, Samuel M., Keith M. Ericson, David Laibson, George Loewenstein, and Jonathan D. Cohen. 2007. "Time Discounting for Primary Rewards." Journal of Neuroscience 27 (21): 5796-804. DOI: 10.1523/JNEUROSCI.4246-06.2007. [14, 23]
- McClure, Samuel M., David Laibson, George Loewenstein, and Jonathan D. Cohen. 2004. "Separate Neural Systems Value Immediate and Delayed Monetary Rewards." Science 306 (5695): 503-7. DOI: 10.1126/science.1100907. [14, 23]
- Samuelson, Paul. 1937. "A Note on Measurement of Utility." Review of Economic Studies 4(2): 155-61. DOI: 10.2307/2967612. [23]
- Sims, Christopher A. 2003. "Implications of rational inattention." Journal of Monetary Economics 50(3): 665-90. DOI: 10.1016/S0304-3932(03)00029-1. [6]
- Sullivan, Paul. 2016. "Fresh Thinking on Saving." New York Times (New York edition), March 27, 2016: F2. URL: http://nytimes.com/2016/03/27/your-money/getting-workers-tosave-more-for-retirement.html. [5]
- Taubinsky, Dmitry. 2014. "From Intentions to Actions: A Model and Experimental Evidence of Inattentive Choice." Working paper. Hanover, NH, USA: Dartmouth College. URL: https://docs.google.com/viewer?a=v&pid=sites&srcid= ZGVmYXVsdGRvbWFpbnxkbWl0cnlwYXBlcnN8Z3g6NmIzYWM0MWIwNTc4MjkwNQ. [6]
- Vosgerau, Joachim, Sabrina Bruyneel, Ravi Dhar, and Klaus Wertenbroch. 2008. "Ego Depletion and Cognitive Load: Same or Different Constructs?" In Advances in Consumer Research. Vol. 35, Association for Consumer Research, 217–20. URL: http://www.acrwebsite.org/ search/view-conference-proceedings.aspx?Id=13549. [24]
- Warner, John T., and Saul Pleeter. 2001. "The Personal Discount Rate: Evidence from Military Downsizing Programs." American Economic Review 91(1): 33-53. DOI: 10.1257/aer.91.1.33. [24]
- Yaari, Menahem E. 1965. "Uncertain Lifetime, Life Insurance, and the Theory of the Consumer." Review of Economic Studies 32 (2): 137-50. DOI: 10.2307/2296058. [24]

Chapter 2

My Second Paper*

Joint with Adam Smith, Janet Smith, and Jeremiah Smith

2.1 Introduction

"Most people can save a few dollars a day or even \$10 a day," she said. "That's doable. But if you say, 'Can you save \$300 a month or a couple of thousand dollars a year?' people will say, 'Whoa.' Avoiding that 'whoa,' which is the hesitancy that can derail planning, is what consultants like Ms. Davidson are trying to do."

-New York Times, March 27, 2016

This template uses the Charter typeface for the body text. Charter is a serif typeface and was designed in 1987 by Matthew Carter. By contrast, all headings, tables, and captions are set in a sans-serif typeface. The sans-serif typeface used in this document is Fira Sans, designed by Erik Spiekermann and collaborators.

The math settings are adjusted in the preamble to the effect that mathematical formulas are automatically typeset in the same font as the surrounding text. That is, math in a serif environment will be set in a serif font, while math in a sans-serif environment will use the sans-serif font. This is an aesthetic choice that may not please everyone given that a sans-serif font may be used in mathematical formulas to express a particular meaning. These cases, however, are very rare.

Let us cite some publications: Andersen, Harrison, Lau, and Rutström (2008), Andreoni and Sprenger (2012), Kőszegi and Szeidl (2013), and Balakrishnan, Haushofer, and Jakiela (2016). With the options set for BibLaTeX in the preamble, citations in the body text are automatically sorted chronologically—irrespective of the order of the "citekeys" in your input. Of course, entries are sorted alphabetically by author surname in the list of references.

^{*} This footnote can be used for acknowledgments. This is where you can express your gratitude to referees, editors, and colleagues for their valuable feedback and suggestions that helped improve your manuscript. Financial support by third parties can also be mentioned here.

After this fourth paragraph, we start a new paragraph sequence. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

This is the second paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

Some more references: See Sims (2003) and Gabaix (2014) for models of "rational inattention" or "goal-driven attention." See Bordalo, Gennaioli, and Shleifer (2012), Bordalo, Gennaioli, and Shleifer (2013), Kőszegi and Szeidl (2013), Taubinsky (2014), and Bushong, Rabin, and Schwartzstein (2016) for models of "stimulus-driven attention."

And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

After this fourth paragraph, we start a new paragraph sequence. Hello, here is some text without a meaning. This text should show what a printed text will

look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n}b$.

In Section 2.2, we describe the design of our study. We present the data analysis and our results in Section 2.3. In Section 2.4, we discuss the plausibility of potential alternative explanations. Section 2.5 concludes.

2.2 Methods

In this section, we first present the design of the experiment (2.2.1) and derive behavioral predictions (2.2.2).

2.2.1 Design of the Main Experiment

2.2.1.1 General Features

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

2.2.1.2 More Specific Features

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

Let's test the euro symbol: €1,234.56. Let's also test text superscripts: i^{th} and text subscripts: CO_2 and CO_2 . Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n}b$. Let's test the footnote settings.

Figure 2.2.3 shows an exemplary decision screen with B = €11 and $r \approx 15\%$ for both BAL $_{1:1}^{I}$ (upper panel) and UNBAL $_{1:8}^{I}$ (lower panel). Through a slider, subjects choose their preferred $x \in X$. The slider position in Figure 2.2.3 indicates x = 0.5, i.e., the earliest payment is reduced by €5.50. Since $r \approx 15\%$ in this example, this slider position amounts to €6.30 that are paid at later payment dates. While these €6.30 are paid in a single bank transfer on the latest payment date in BAL $_{1:1}^{I}$, the amount is dispersed in equal parts over the last 8 payment dates in UNBAL $_{1:8}^{I}$ —i.e., 8 consecutive payments of €0.79.3

^{1.} Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

^{2.} The slider had no initial position—it appeared only after subjects first positioned the mouse cursor over the slider bar. This was done to avoid default effects.

^{3.} We always rounded the second decimal place up so that the sum of the payments included in a dispersed payoff was always at least as great as the respective concentrated payoff.

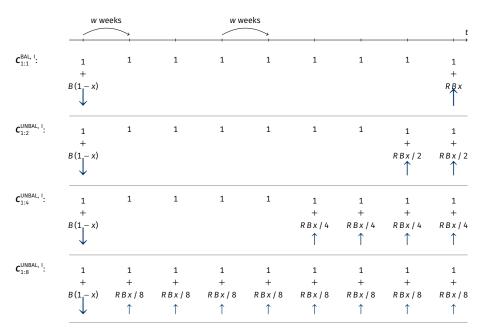


Figure 2.2.1. Budget Sets $C_{1:1}^{\text{BAL, I}}$ and $C_{1:n}^{\text{UNBAL, I}}$

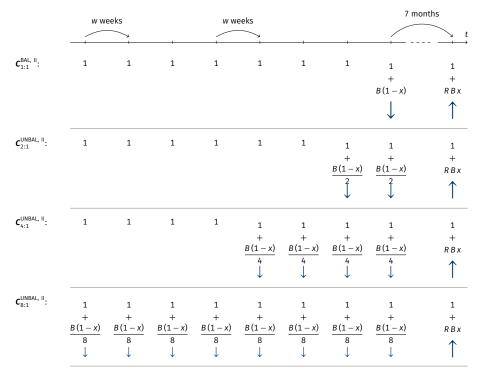


Figure 2.2.2. Budget Sets $\mathbf{C}_{1:1}^{\text{BAL, II}}$ and $\mathbf{C}_{n:1}^{\text{UNBAL, II}}$

Notes: For the values of B, R, and w that we used, see Section 2.2.1.4. The savings rate x is individuals' choice variable: they choose some $x \in X = \{0, \frac{1}{100}, \frac{2}{100}, \dots, 1\}$ in each trial. The arrows indicate whether and in which direction payments at the respective payment dates change if x is increased. This figure was taken from Dertwinkel-Kalt, Gerhardt, Riener, Schwerter, and Strang (2017).

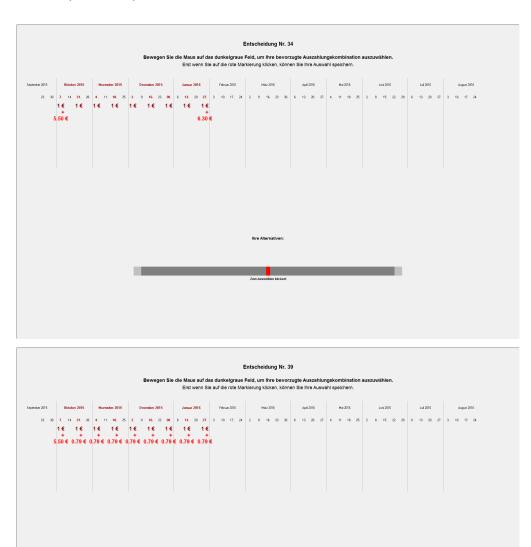


Figure 2.2.3. Screenshots of a BAL $_{1:1}^{1}$ Decision (Top) and an UNBAL $_{1:8}^{1}$ Decision (Bottom)

Note: This figure was taken from Dertwinkel-Kalt et al. (2017).

2.2.1.3 Some More Details

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A

blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

Here's a bulleted list:

- Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.
- Hello, here is some text without a meaning. $d\Omega = \sin\vartheta d\vartheta d\varphi$. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sin^2(\alpha) + \cos^2(\beta) = 1$. This text should contain *all letters of the alphabet* and it should be written in of the original language $E = mc^2$. There is no need for special contents, but the length of words should match the language. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$.
- Hello, here is some text without a meaning. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. This text should show what a printed text will look like at this place. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. If you read this text, you will get no information. $d\Omega = \sin\vartheta d\vartheta d\varphi$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. $\sin^2(\alpha) + \cos^2(\beta) = 1$.

2.2.1.4 Procedure

Describe the sequence of events in your study. You could do this with the help of an enumerated list:

1. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you

will get no information $E=mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

- 2. Hello, here is some text without a meaning. $d\Omega = \sin \vartheta d\vartheta d\varphi$. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sin^2(\alpha) + \cos^2(\beta) = 1$. This text should contain *all letters of the alphabet* and it should be written in of the original language $E = mc^2$. There is no need for special contents, but the length of words should match the language. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$.
- 3. Hello, here is some text without a meaning. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. This text should show what a printed text will look like at this place. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. If you read this text, you will get no information. $d\Omega = \sin\vartheta d\vartheta d\varphi$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. $\sin^2(\alpha) + \cos^2(\beta) = 1$.

2.2.2 Predictions

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two

pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages. Let's include a really, really long footnote to check how it is split across two pages.⁴

4. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift - not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift - not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information?

By discounted utility we understand any intertemporal utility function that is time-separable and that values a payment farther in the future at most as much as an equal-sized payment closer in the future. Importantly, the predictions derived below hold for all three frequently used types of discounting—exponential, hyperbolic, and quasi-hyperbolic.

In the following, we assume that individuals base their decisions on utility derived from receiving monetary payments c_t at various dates t. This is an assumption that is frequently made in experiments on intertemporal decision making. One way to justify this assumption is that individuals anticipate to consume the payments they receive within a short period around date t. Given that the maximum payment was below €20 and that any two payment dates were separated by at least two weeks, this assumption seems reasonable (see the arguments in favor of this view in Halevy, 2014). Kőszegi and Szeidl (2013) themselves make the same assumption of "money in the utility function": "in some applications we also assume that monetary transactions induce direct utility consequences, so that for instance an agent making a payment experiences an immediate utility loss. The idea that people experience monetary transactions as immediate utility is both intuitively compelling and supported in the literature: ... some evidence on individuals' attitudes toward money, such as narrow bracketing (...) and laboratory evidence on hyperbolic discounting (...), is difficult to explain without it." Last but not least, the papers by McClure, Laibson, Loewenstein, and Cohen (2004) and McClure, Ericson, Laibson, Loewenstein, and Cohen (2007) demonstrate that brain activation, as measured by functional magnetic resonance imaging, is similar for primary and monetary rewards. Additionally, we make the standard assumption that utility from money is increasing in its argument but not convex: $u'(c_t) \ge 0$ and $u''(c_t) \le 0$.

2.2.2.1 Discounted Utility

Individuals make their allocation decisions by comparing the aggregated consumption utility of each earnings sequence $c \in C$. Discounted utility assumes that the utility of each period enters overall utility additively. That is, utility derived from the payment to be received at future date t can be expressed as $u_t(c_t) := D(t) u(c_t)$. Here, D(t) denotes the individual's discount function for conversion of future utility into present utility. The discount function satisfies $0 \le D(t)$ and $D'(t) \le 0$, such that

Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

a payment further in the future is valued at most as much as an equal-sized payment closer in the future.⁵

The utility of earnings sequence c with payments c_t in periods t = 1, ..., T is

$$U(\mathbf{c}) = \sum_{t=1}^{T} u_t(c_t) = \sum_{t=1}^{T} D(t) u(c_t).$$
 (2.2.1)

Individuals choose how much to allocate to the different periods by maximizing their utility over all possible earnings sequences available within a given budget set C, see equation (2.2.1). We use the superscript $^{\mathrm{DU}}$ to indicate decisions based on discounted utility.

A Subparagraph. This is the second paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

And after the second paragraph follows the third paragraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

Another Subparagraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

^{5.} Normalization such that $D(t) \le 1$ is not necessary in our case. Provided that t is a metric time measure, where t = 0 stands for the present, examples are $D(t) := \delta^t$ with some $\delta > 0$ for exponential discounting and $D(t) := (1 + \alpha t)^{-\gamma/\alpha}$ with some $\alpha, \gamma > 0$ for generalized hyperbolic discounting.

2.2.2.2 Focus-Weighted Utility

In this section, we extend the model of discounted utility through "focus weights," as proposed by Kőszegi and Szeidl (2013). Period-t weights g_t scale period-t consumption utility u_t . Individuals are assumed to maximize focus-weighted utility, which is defined as follows:

$$\tilde{U}(\boldsymbol{c},\boldsymbol{C}) := \sum_{t=1}^{T} g_t(\boldsymbol{C}) u_t(c_t). \tag{2.2.2}$$

In contrast to discounted utility U(c), focus-weighted utility $\tilde{U}(c, C)$ has two arguments: the earnings sequence c and the choice set C. The latter dependence is due to the weights g_t . These are given by a strictly increasing weighting function g that takes as its argument the difference between the maximum and the minimum attainable utility in period t over all possible earnings sequences in set C:

$$g_t(\mathbf{C}) := g[\Delta_t(\mathbf{C})] \text{ with } \Delta_t(\mathbf{C}) := \max_{c \in \mathbf{C}} u_t(c_t) - \min_{c \in \mathbf{C}} u_t(c_t).$$
 (2.2.3)

If the underlying consumption utility function is characterized by discounted utility, then $u_t(c_t) := D(t) u(c_t)$. That is, focused thinkers put more weight on period t than on period t' if the discounted-utility distance between the best and worst alternative is larger for period t than for period t'.

A Subparagraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

Yet Another Subparagraph. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

2.2.2.3 Hypotheses

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will

get no information $E=mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. This gives rise to our first hypothesis:

Hypothesis 3. This environment can be used to clearly state your hypothesis and set them apart from the body text.

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. Based on this, we can state our second hypothesis:

Hypothesis 4. This environment can be used to clearly state your hypothesis and set them apart from the body text.

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

2.3 Results

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. With this, we can test our hypotheses.

Table 2.3.1. An Example Table

Dependent variable	â
Estimate	0.123*** (0.011)
Observations Subjects	750 250

Notes: Standard errors in parentheses, clustered on the subject level. * p < 0.10, ** p < 0.05, *** p < 0.01.

2.3.1 Test of Hypothesis 3

Our first result supports Hypothesis 3. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain *all letters of the alphabet* and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. The analysis we conducted to obtain Result 3 is described in detail in Table 2.3.1. Let's reference a section, a subsection, and a figure from the appendices: Section 2.C, Section 2.A.2, Figure 2.B.1.

Result 3. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n}{b}$.

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$

There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

2.3.2 Test of Hypothesis 4

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$. We thereby test Hypothesis 4.

Result 4. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

Our second result provides evidence in support of Hypothesis 4. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

2.3.3 Heterogeneity

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a}$

There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

$$\bar{x} = \frac{1}{n} \sum_{i=1}^{i=n} x_i = \frac{x_1 + x_2 + \dots + x_n}{n}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

$$\int_0^\infty e^{-\alpha x^2} dx = \frac{1}{2} \sqrt{\int_{-\infty}^\infty e^{-\alpha x^2}} dx \int_{-\infty}^\infty e^{-\alpha y^2} dy = \frac{1}{2} \sqrt{\frac{\pi}{\alpha}}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

$$\sum_{k=0}^{\infty} a_0 q^k = \lim_{n \to \infty} \sum_{k=0}^n a_0 q^k = \lim_{n \to \infty} a_0 \frac{1 - q^{n+1}}{1 - q} = \frac{a_0}{1 - q}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-p \pm \sqrt{p^2 - 4q}}{2}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

$$\frac{\partial^2 \Phi}{\partial x^2} + \frac{\partial^2 \Phi}{\partial y^2} + \frac{\partial^2 \Phi}{\partial z^2} = \frac{1}{c^2} \frac{\partial^2 \Phi}{\partial t^2}$$

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{a} = \sqrt[n]{a}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^nb}$.

2.3.4 Structural Estimation

After this fourth paragraph, we start a new paragraph sequence. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

$$\Sigma := \operatorname{Cov}(X) = \begin{bmatrix} \operatorname{Var}(X_1) & \cdots & \operatorname{Cov}(X_1, X_n) \\ \vdots & \ddots & \vdots \\ \operatorname{Cov}(X_n, X_1) & \cdots & \operatorname{Var}(X_n) \end{bmatrix}$$

	Utopia	Computer Modern	Charter	Times Roman	Palatino
Yoël	1	1	2	0	1
Çelik	2	0	2	1	0
Anità	1	2	1	2	0
Uğur	1	2	0	1	0
Håkan	1	0	2	0	1
Allison	2	0	1	2	1
Pía	1	0	2	1	0
David	1	0	2	1	1
Sum	10	5	12	8	4

Table 2.4.1. Points awarded in our typeface competition—basic formatting

Discussion 2.4

2.4.1 Some Limitations

Let's reference some tables: Table 2.4.1 and Table 2.4.2. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

2.4.2 Utility from Money

In deriving our predictions (Section 2.2.2), we assume that subjects base their decisions on utility derived from receiving monetary payments c_t at various dates t. We also make the standard assumption that utility from money is increasing in its argument but not convex, i.e., $u'(c_t) \ge 0$ and $u''(c_t) \le 0$. Both assumptions are frequently made in studies on intertemporal decision making.

One way to justify the assumption of utility being based on money—rather than consumption—is that individuals anticipate to consume the payments that they receive at date t within a short period around t. Given that the maximum payment was below €20 and that any two payment dates were separated by at least two weeks, this seems reasonable (see the arguments in favor of this view in Halevy, 2014).

A second justification is consistency within the discipline: Halevy (2014) points out that "in the domain of risk and uncertainty ... preferences are often defined over payments." In line with this, Kőszegi and Szeidl (2013, p. 62) make the same assumption of "money in the utility function":

in some applications we also assume that monetary transactions induce direct utility consequences, so that for instance an agent making a payment experiences an immediate utility loss. The idea that people experience monetary transactions as immediate utility is both intuitively compelling and supported in the literature: ... some evidence on individuals' attitudes toward money, such as narrow bracketing (...) and laboratory evidence on hyperbolic discounting (...), is difficult to explain without it.

Last but not least, the papers by McClure, Laibson, et al. (2004) and McClure, Ericson, et al. (2007) demonstrate that brain activation, as measured by functional magnetic resonance imaging, is similar for primary and monetary rewards.

Let us now discuss the second assumption: that utility from money is nonconvex. We find that subjects allocate more money to the concentrated payoffs in the unbalanced than in the associated balanced budget sets—which we call concentration bias. One might argue that this relative preference for concentrated payoffs can be explained by the per-period utility function over money being convex.

Obtaining evidence on the shape of utility over money is nontrivial because it requires that at least two monetary amounts be compared with each other without the one clearly dominating the other. Thus, estimates of the curvature of the utility function over money can be obtained in two ways: the monetary amounts must be

Table 2.4.2. Points awarded in our typeface competition—more sophisticated formatting	Table 2.4.2.	Points awarded in	our typeface	competition-more	sophisticated formatting
--	--------------	-------------------	--------------	------------------	--------------------------

	Utopia ^a	Computer Modern ^b	Charter ^c	Times Roman ^d	Palatino ^e
Yoël	1	1	2	0	1
Çelik	2	0	2	1	0
Anità	1	2	1	2	0
Uğur	1	2	0	1	0
Håkan	1	0	2	0	1
Allison	2	0	1	2	1
Pía	1	0	2	1	0
David	1	0	2	1	1
Sum	10	5	12	8	4

a \usepackage{fourier}

^b The ŁTFX standard serif font.

c \usepackage[charter]{mathdesign}

d \usepackage{newtxtext, newtxmath}

e \usepackage[sc]{mathpazo}

paid in different states of the world, i.e., comprise a lottery, or they have to be paid at different points in time.⁶ Both methods entail particular theoretical assumptions.

Andersen et al. (2008) advocate the former approach and argue that when estimating time preference parameters, one should control for the curvature of the utility function through a measure of the curvature that is based on observed choices under risk. Their study and numerous other studies on risk attitudes consistently reveal that the vast majority of subjects is risk-averse even over small stakes. Hence, for the vast majority of subjects, utility over money is concave according to this methodology (ruling out probability weighting). Others, most notably Andreoni and Sprenger (2012), have argued that the degree of curvature measured via risky choices probably overstates the degree of curvature effective in intertemporal choices, but they also find that utility is concave (albeit close to linear). Given this unambiguous evidence from previous studies, it is implausible that our subjects exhibit convex utility over money.

2.5 Conclusion

Cite some more papers (Yaari, 1965; Warner and Pleeter, 2001; Davidoff, Brown, and Diamond, 2005; Benartzi, Previtero, and Thaler, 2011). Let's cite a book: Luce (1959). Let's cite a contribution to a collected volume: Harrison and Rutström (2008) and a collection (an edited volume) itself: Kagel and Roth (2016). Now let's cite presentations at conferences: Vosgerau, Bruyneel, Dhar, and Wertenbroch (2008) and Beute and Kort (2012). Attema, Bleichrodt, Gao, Huang, and Wakker (2016) propose a method for "measuring discounting without measuring utility".

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text *like this* gives you information about the selected font, how the letters are written and an impression of the look. This text should contain *all letters of the alphabet* and it should be written in of the original language. There is no need for special contents, but the length of words should match the language.

^{6.} As a matter of fact, the latter was the motivation behind Samuelson (1937): "Under the following four assumptions, it is believed possible to arrive theoretically at a precise measure of the marginal utility of *money income* ..." (p. 155; emphasis in the original).

^{7.} The basic idea of their method is intriguingly simple: Imagine an individual who is indifferent between, say, Option A: \$10 today and Option B: \$10 in one year plus \$10 in two years. With a constant annual discount factor δ , this indifference translates to $u(\$10) = \delta u(\$10) + \delta^2 u(\$10)$, so that u(\$10) cancels out, and δ can be readily calculated as the solution to $1 = \delta + \delta^2$.

Appendix 2.A Put More Complicated Derivations and Proofs Here

2.A.1 Appendix Subsection

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. $\sin^2(\alpha) + \cos^2(\beta) = 1$. If you read this text, you will get no information $E = mc^2$. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift - not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$. This text should contain all letters of the alphabet and it should be written in of the original language. $\sqrt[n]{\frac{a}{b}} = \sqrt[n]{\frac{a}{b}}$. There is no need for special contents, but the length of words should match the language. $a\sqrt[n]{b} = \sqrt[n]{a^n b}$.

- 1. Erster Listenpunkt, Stufe 1
 - a. Erster Listenpunkt, Stufe 2
 - i. Erster Listenpunkt, Stufe 3
 - ii. Zweiter Listenpunkt, Stufe 3
 - iii. Dritter Listenpunkt, Stufe 3
 - iv. Vierter Listenpunkt, Stufe 3
 - b. Zweiter Listenpunkt, Stufe 2
 - c. Dritter Listenpunkt, Stufe 2
 - d. Vierter Listenpunkt, Stufe 2
- 2. Zweiter Listenpunkt, Stufe 1
- 3. Dritter Listenpunkt, Stufe 1
- 4. Vierter Listenpunkt, Stufe 1

The typeset math below follows the ISO recommendations that only variables be set in italic. Note the use of upright shapes for "d," "e," and " π ." (These are entered as \mathup{d}, \mathup{e}, and \mathup{\pi}, respectively.)

Theorem 2 (Simplest form of the Central Limit Theorem). Let X_1, X_2, \cdots be a sequence of i.i.d. random variables with mean 0 and variance 1 on a probability space $(\Omega, \mathcal{F}, \mathbb{P})$. Then

$$\mathbb{P}\left(\frac{X_1 + \dots + X_n}{\sqrt{n}} \le y\right) \to \mathfrak{N}(y) := \int_{-\infty}^{y} \frac{e^{-v^2/2}}{\sqrt{2\pi}} dv \quad as \ n \to \infty,$$

or, equivalently, letting $S_n := \sum_{1}^{n} X_k$,

$$\mathbb{E}f\left(S_n/\sqrt{n}\right) \to \int_{-\infty}^{\infty} f(v) \frac{\mathrm{e}^{-v^2/2}}{\sqrt{2\pi}} \, \mathrm{d}v \quad as \ n \to \infty, for \ every \ f \in \ \mathbf{b}\mathscr{C}(\mathbb{R}).$$

2.A.2 Salience

Salience theory (Bordalo, Gennaioli, and Shleifer, 2012, 2013) represents a behavioral model according to which the most distinctive features of the available alternatives receive a particularly large share of attention and are therefore over-weighted. More precisely, a particular attribute out of all attributes of an alternative becomes the more salient, the more it differs from that attribute's average level over all available alternatives.

Formally, alternatives are assumed to be uniquely characterized by the values they take in $T \ge 1$ attributes (or, "dimensions"). Utility is assumed to be additively separable in attributes, and salience attaches a decision weight to each attribute of each good which indicates how salient the respective attribute is for that good. Suppose an agent chooses one alternative from some finite choice set C. Let t index the T different attributes, and let t index the t available alternatives. Let t index the function which assigns utility to values in dimension t. Denote by t the level of attribute t of good t and define t in t as the utility that dimension t of good t yields. Let t be the average utility level, across all t goods, of dimension t. The salience of each dimension of good t is determined by a symmetric and continuous salience function t0. That satisfies the following two properties:

1. Ordering. Let $\mu := \operatorname{sgn}(u_t^k - \overline{u}_t)$. Then for any $\epsilon, \epsilon' \ge 0$ with $\epsilon + \epsilon' > 0$, it holds that

$$\sigma(u_t^k + \mu \, \epsilon, \overline{u}_t - \mu \, \epsilon') \, > \, \sigma(u_t^k, \overline{u}_t). \tag{2.A.1}$$

2. Diminishing sensitivity. For any $u_t^k, \overline{u}_t \ge 0$ and all $\epsilon > 0$, it holds that

$$\sigma(u_t^k + \epsilon, \overline{u}_t + \epsilon) < \sigma(u_t^k, \overline{u}_t).$$
 (2.A.2)

Following the smooth salience characterization proposed in Bordalo, Gennaioli, and Shleifer (2012, p. 1255), each dimension t of good k receives weight $\Delta^{-\sigma(u_t^k, \bar{u}_t)}$, where $\Delta \in (0,1]$ is a constant that captures an agent's susceptibility to salience. $\Delta = 1$ gives rise to a rational decision maker, and the smaller Δ , the stronger is the salience bias. We call an agent with $\Delta < 1$ a salient thinker.

A reference with a large number of authors is Henrich, Boyd, Bowles, Camerer, Fehr, et al. (2005).

Appendix 2.B Some Additional Figures

	w we	eeks					w w	eeks	
			i						
c _{CL} ^{BAL} (1):	1 + B	1	1	1	1	1	1	1	$\longrightarrow \longmapsto t$ 1
c _{CL} ^{BAL} (2):	1	1 + B+i	1	1	1	1	1	1	1
c _{CL} (3):	1	1	1 + B + 2i	1	1	1	1	1	1
c _{CL} ^{BAL} (4):	1	1	1	1 + B + 3i	1	1	1	1	1
c _{CL} ^{BAL} (5):	1	1	1	1	1 + B + 4i	1	1	1	1
c _{CL} (6):	1	1	1	1	1	1 + B + 5i	1	1	1
c _{CL} (7):	1	1	1	1	1	1	1 + B + 6 <i>i</i>	1	1
c _{CL} (8):	1	1	1	1	1	1	1	1 + B + 7i	1
c _{CL} ^{BAL} (9):	1	1	1	1	1	1	1	1	1 + B + 8i

Figure 2.B.1. Earnings Sequences Included in Choice List $C_{\text{CL}}^{\text{BAL}}$

Notes: For the values of B, i, and w that we used see Section 2.2. Figure taken from Dertwinkel-Kalt et al. (2017).

	w w	eeks					w we	eeks	
			+	+	+	+			\longrightarrow t
c _{CL} ^{UNBAL, I} (1):	1 + B	1	1	1	1	1	1	1	1
c _{CL} ^{UNBAL, I} (2):	1 B+i 2	‡ <u>B+i</u> 2	1	1	1	1	1	1	1
c _{CL} ^{UNBAL, I} (3):	‡ B+2i 3	$\frac{1}{\frac{B+2i}{3}}$	$\frac{1}{4}$ $\frac{B+2i}{3}$	1	1	1	1	1	1
c _{CL} ^{UNBAL, I} (4):	1 B+3i 4	‡ B+3i 4	‡ <u>B+3i</u> 4	1 B+3i 4	1	1	1	1	1
c _{CL} ^{UNBAL, I} (5):	1 <u>B+4i</u> 5	1 <u>B+4i</u> 5	1 <u>B+4i</u> 5	1 <u>B+4i</u> 5	1 <u>B+4i</u> 5	1	1	1	1
c _{CL} ^{UNBAL, I} (6):	1 <u>B+5i</u> 6	1 <u>B+5i</u> 6	1 B+5i 6	1 <u>B+5i</u> 6	1 + <u>B+5i</u> 6	‡ <u>B+5i</u> 6	1	1	1
c _{CL} ^{UNBAL, I} (7):	1 B+6i 7	‡ <u>B+6i</u> 7	1 B+6i 7	1 B+6i 7	1 <u>B+6i</u> 7	‡ <u>B+6i</u> 7	‡ <u>B+6i</u> 7	1	1
c _{CL} ^{UNBAL, I} (8):	‡ <u>B+7i</u> 8	‡ <u>B+7i</u> 8	‡ <u>B+7i</u> 8	‡ <u>B+7i</u> 8	1 <u>B+7i</u> 8	‡ <u>B+7i</u> 8	‡ <u>B+7i</u> 8	‡ <u>B+7i</u> 8	1
c _{CL} ^{UNBAL, I} (9):	1 + B+8i 9	‡ <u>B+8i</u> 9	‡ <u>B+8i</u> 9	1 <u>B+8i</u> 9	1 <u>+</u> <u>B+8i</u> 9	‡ <u>B+8i</u> 9	‡ <u>B+8i</u> 9	‡ <u>B+8i</u> 9	1 <u>B+8i</u> 9

Figure 2.B.2. Earnings Sequences Included in Choice List $\mathbf{C}_{\mathsf{CL}}^{\mathsf{UNBAL},\mathsf{I}}$

Notes: For the values of B, i, and w that we used see Section 2.2. Figure taken from Dertwinkel-Kalt et al. (2017).

	W W	reeks					w we	eeks	
c _{CL} ^{UNBAL, II} (1):	1 1 B 9	1 B 9	1 B B 9	1 B 9	1 B 9	1 B B 9	1 1 B 9	1 B B 9	$ \begin{array}{ccc} & & \downarrow & \downarrow \\ & & \downarrow & \downarrow \\ & & \downarrow & \downarrow \\ & & \downarrow & \downarrow & \downarrow \\ & & \downarrow & \downarrow & \downarrow \\ & & \downarrow & \downarrow & \downarrow & \downarrow \\ & & \downarrow & \downarrow & \downarrow & \downarrow \\ & & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & & \downarrow \\ & & \downarrow \\ & & \downarrow \\ & & \downarrow \\ & & \downarrow \\ & & \downarrow \\ & & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\ & \downarrow & $
c _{CL} ^{UNBAL, II} (2):	1	$\frac{1}{+}$ $\frac{B+i}{8}$	$\frac{1}{\frac{B+i}{8}}$	1 B+i 8	1 B+i 8	$\frac{1}{+}$ $\frac{B+i}{8}$	$\frac{1}{+}$ $\frac{B+i}{8}$	‡ <u>B+i</u> 8	$\frac{1}{+}$ $\frac{B+i}{8}$
c _{CL} ^{UNBAL, II} (3):	1	1	$\frac{1}{+}$ $\frac{B+2i}{7}$	‡ <u>B+2i</u> 7	1 B+2i 7	‡ B+2i 7	$\begin{array}{c} \frac{1}{+} \\ \frac{B+2i}{7} \end{array}$	1 + B+2i 7	1 B+2i 7
c _{CL} ^{UNBAL, II} (4):	1	1	1	‡ <u>B+3i</u> 6	1 <u>B+3i</u> 6	‡ <u>B+3i</u> 6	‡ <u>B+3i</u> 6	1 <u>B+3i</u> 6	1 B+3i 6
c _{CL} ^{UNBAL, II} (5):	1	1	1	1	1 + <u>B+4i</u> 5	‡ <u>B+4i</u> 5	‡ <u>B+4i</u> 5	1 + <u>B+4i</u> 5	1 B+4i 5
c _{CL} ^{UNBAL, II} (6):	1	1	1	1	1	‡ 8+5i 4	1 <u>B+5i</u> 4	1 + <u>B+5i</u> 4	1 B+5i 4
c _{CL} ^{UNBAL, II} (7):	1	1	1	1	1	1	$\frac{1}{+}$ $\frac{B+6i}{3}$	1 + B+6i 3	1 B+6i 3
c _{CL} ^{UNBAL, II} (8):	1	1	1	1	1	1	1	1 + <u>B+7i</u> 2	$\frac{1}{+}$ $\frac{B+7i}{2}$
c _{CL} ^{UNBAL, II} (9):	1	1	1	1	1	1	1	1	1 + B + 8i

Figure 2.B.3. Earnings Sequences Included in Choice List $\mathbf{C}_{\mathsf{CL}}^{\mathsf{UNBAL},\mathsf{II}}$

Notes: For the values of B, i, and w that we used see Section 2.2. Figure taken from Dertwinkel-Kalt et al. (2017).

Appendix 2.C siunitx Example Tables

Table 2.C.1. An Example of a Regression Table (Adapted from Gerhardt, Schildberg-Hörisch, and Willrodt, 2017). Never Forget to Mention the Dependent Variable!

	(1)	(2)	(3)	(4)	(5)
Treatment	-0.390	-0.228	-0.729*	-0.449*	-0.453**
	(+0.352)	(-0.205)	[+0.377]	[-0.245]	{+0.204 }
Female	0.948***	0.061	0.188	0.305	0.385*
	(0.354)	(0.233)	(0.372)	(0.226)	(0.222)
Female \times Treatment	0.169	0.251	0.892*	0.454	0.439
	(0.514)	(0.325)	(0.533)	(0.341)	(0.307)
Final high school grade	-0.101	0.013	0.076	0.117	0.039
	(0.198)	(0.144)	(0.224)	(0.146)	(0.133)
Trait self-control	-0.016	0.002	-0.016	-0.000	-0.007
	(0.016)	(0.010)	(0.015)	(0.010)	(0.009)
Constant	2.357***	1.512***	-0.322	2.158***	1.437***
	(0.239)	(0.144)	(0.265)	(0.161)	(0.152)
Observations	303	289	295	304	1191
R^2	0.057	800.0	0.039	0.043	0.024
Treatment × (1 + Female)	-0.221	0.023	0.163	0.004	-0.014
$p_{\scriptscriptstyle F}[{ m Treatment} imes { m (1 + Female)} = 0]$	0.327	0.008	0.192	0.000	0.003

Notes: Dependent variable: m_{\sim} . Robust standard errors (cluster-corrected for column 5) in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1. Missing observations (N < 308) due to exclusion of trials in which subjects behaved irrationally (i.e., chose a dominated option). The regressors Final high school grade and Trait self-control are mean-centered.

Table 2.C.2. Figure Grouping via siunitx in a Table.

(1)	(2)	(3)
-0.100*	-0.100 01*	-123456.444***
(2.871)	(2.87123)	[+50000.123]

Table 2.C.3. Overview of the Choice Lists Presented to Subjects (Adapted from Gerhardt, Schildberg-Hörisch, and Willrodt, 2017).

		Altern	ative A			Alternative B			
	C _{A,1}	<i>p</i> _{A,1}	C _{A,2}	P _{A,2}	C _{B,1}	р _{в,1}	С _{В,2}	р _{в,2}	
Choice List I: risky/risky (x = €22.00, r =	€7.50, k	= €11.50;	25 rows)					
Top row	€ 3.00	50%	€22.00	50%	€ 3.00	50%	€ 7.00	50%	
Center row	€ 3.00	50%	€22.00	50%	€ 9.00	50%	€13.00	50%	
Row with $m = 0$	€ 3.00	50%	€22.00	50%	€10.50	50%	€14.50	50%	
Bottom row	€ 3.00	50%	€22.00	50%	€15.00	50%	€19.00	50%	
Choice List II: safe/risky (x = €16.00, r =	€5.00, k	= €5.00; 1	9 rows)					
Top row	€11.00	100%			€11.00	50%	€21.00	50%	
Center row	€11.00	100%			€ 6.50	50%	€16.50	50%	
Row with $m = 0$	€11.00	100%			€ 6.00	50%	€16.00	50%	
Bottom row	€11.00	100%			€ 2.00	50%	€12.00	50%	
Choice List III: "long shot"	" (x = €14.00, r :	= -€36.0	00, <i>k</i> = €7.	00; 21 ro	ws)				
Top row	€ 7.00	90%	€50.00	10%	€ 7.00	90%	€10.00	10%	
Row with $m = 0$	€ 7.00	90%	€50.00	10%	€11.00	90%	€14.00	10%	
Center row	€ 7.00	90%	€50.00	10%	€12.00	90%	€15.00	10%	
Bottom row	€ 7.00	90%	€50.00	10%	€17.00	90%	€20.00	10%	
Choice List IV: delayed pa	yoffs (x = €18.0	0, r = €6	5.00, k = €	8.50, paid	d in one wee	k; 20 ro	ws)		
Top row	€ 9.50	50%	€12.00	50%	€ 9.50	50%	€24.00	50%	
Above-center row	€ 9.50	50%	€12.00	50%	€ 5.00	50%	€19.50	50%	
Below-center row	€ 9.50	50%	€12.00	50%	€ 4.50	50%	€19.00	50%	
Row with $m = 0$	€ 9.50	50%	€12.00	50%	€ 3.50	50%	€18.00	50%	
Bottom row	€ 9.50	50%	€12.00	50%	€ 0.00	50%	€14.50	50%	

- Andersen, Steffen, Glenn W. Harrison, Morten I. Lau, and E. Elisabet Rutström. 2008. "Eliciting Risk and Time Preferences." *Econometrica* 76 (3): 583–618. DOI: 10.1111/j.1468-0262.2008. 00848.x. [35, 54]
- Andreoni, James, and Charles Sprenger. 2012. "Estimating Time Preferences from Convex Budgets." American Economic Review 102 (7): 3333–56. DOI: 10.1257/aer.102.7.3333. [35, 54]
- Attema, Arthur E., Han Bleichrodt, Yu Gao, Zhenxing Huang, and Peter P. Wakker. 2016. "Measuring Discounting without Measuring Utility." *American Economic Review* 106 (6): 1476–94. DOI: 10.1257/aer.20150208. [54]
- Balakrishnan, Uttara, Johannes Haushofer, and Pamela Jakiela. 2016. "How Soon Is Now? Evidence of Present Bias from Convex Time Budget Experiments." IZA Discussion Paper. URL: http://ftp.iza.org/dp9653.pdf. [35]
- Benartzi, Shlomo, Alessandro Previtero, and Richard H. Thaler. 2011. "Annuitization Puzzles." Journal of Economic Perspectives 25 (4): 143–64. DOI: 10.1257/jep.25.4.143. [54]
- Beute, Femke, and Yvonne A. W. de Kort. 2012. "Always Look on the Bright Side of Life: Ego-Replenishing Effects of Daylight versus Artificial Light." In *Proceedings of Experiencing Light 2012: International Conference on the Effects of Light on Wellbeing.* Edited by Y. A. W. de Kort, M. P. J. Aarts, F. Beute, A. Haans, W. A. IJsselsteijn, D. Lakens, K. C. H. J. Smolders, and L. van Rijswijk. Eindhoven University of Technology. Eindhoven, The Netherlands, 1–4. URL: http://2012.experiencinglight.nl/doc/41.pdf. [54]
- Bordalo, Pedro, Nicola Gennaioli, and Andrei Shleifer. 2012. "Salience Theory of Choice Under Risk." *Quarterly Journal of Economics* 127 (3): 1243–85. DOI: 10.1093/qje/qjs018. [36, 56]
- **Bordalo, Pedro, Nicola Gennaioli, and Andrei Shleifer.** 2013. "Salience and Consumer Choice." *Journal of Political Economy* 121(5): 803–43. DOI: 10.1086/673885. [36, 56]
- **Bushong, Benjamin, Matthew Rabin, and Joshua Schwartzstein.** 2016. "A Model of Relative Thinking." Working paper. Cambridge, MA, USA: Harvard University. URL: http://people.hbs.edu/jschwartzstein/RelativeThinking.pdf. [36]
- Davidoff, Thomas, Jeffrey R. Brown, and Peter A. Diamond. 2005. "Annuities and Individual Welfare." American Economic Review 95 (5): 1573–90. DOI: 10.1257/000282805775014281. [54]
- Dertwinkel-Kalt, Markus, Holger Gerhardt, Gerhard Riener, Frederik Schwerter, and Louis Strang. 2017. "Concentration Bias in Intertemporal Choice." Working paper. Bonn, Germany, et al.: University of Bonn et al. URL: https://www.dropbox.com/s/dv20mcu0qkygmjz/Concentration_Bias_in_Intertemporal_Choice.pdf. [39, 40, 57–59]
- **Gabaix, Xavier.** 2014. "A Sparsity-Based Model of Bounded Rationality." *Quarterly Journal of Economics* 129 (4): 1661–710. DOI: 10.1093/qje/qju024. [36]
- Gerhardt, Holger, Hannah Schildberg-Hörisch, and Jana Willrodt. 2017. "Does self-control depletion affect risk attitudes?" *European Economic Review* 100 (November): 463–87. DOI: 10. 1016/j.euroecorev.2017.09.004. [60, 61]
- **Halevy, Yoram.** 2014. "Some Comments on the Use of Monetary and Primary Rewards in the Measurement of Time Preferences." Working paper. University of British Columbia. URL: http://faculty.arts.ubc.ca/yhalevy/monetary_primary.pdf. [44, 52]
- Harrison, Glenn W., and E. Elisabet Rutström. 2008. "Risk Aversion in the Laboratory." In *Risk Aversion in Experiments*. Edited by Glenn W. Harrison and James C. Cox. Vol. 12, Research in Experimental Economics. Bingley, UK: Emerald Group. Chapter 1, 41–196. DOI: 10.1016/S0193-2306(08)00003-3. [54]

- Henrich, Joseph, Robert Boyd, Samuel Bowles, Colin Camerer, Ernst Fehr, Herbert Gintis, Richard McElreath, Michael Alvard, Abigail Barr, Jean Ensminger, Natalie Smith Henrich, Kim Hill, Francisco Gil-White, Michael Gurven, Frank W. Marlowe, John Q. Patton, and David Tracer. 2005. "'Economic man' in cross-cultural perspective: Behavioral experiments in 15 small-scale societies." Behavioral and Brain Sciences 28(6): 795-815, discussion 815-55. DOI: 10.1017/ S0140525X05000142. [56]
- Kagel, John H., and Alvin E. Roth, editors. 2016. The Handbook of Experimental Economics. Vol. 2, Princeton, NJ, USA: Princeton University Press. [54]
- Kőszegi, Botond, and Adam Szeidl. 2013. "A Model of Focusing in Economic Choice." Quarterly Journal of Economics 128(1): 53-104. DOI: 10.1093/qje/qjs049. [35, 36, 44, 46, 52]
- Luce, R. Duncan. 1959. Individual Choice Behavior: A Theoretical Analysis. New York, NY, USA: John Wiley & Sons. [54]
- McClure, Samuel M., Keith M. Ericson, David Laibson, George Loewenstein, and Jonathan D. Cohen. 2007. "Time Discounting for Primary Rewards." Journal of Neuroscience 27 (21): 5796-804. DOI: 10.1523/JNEUROSCI.4246-06.2007. [44, 53]
- McClure, Samuel M., David Laibson, George Loewenstein, and Jonathan D. Cohen. 2004. "Separate Neural Systems Value Immediate and Delayed Monetary Rewards." Science 306 (5695): 503-7. DOI: 10.1126/science.1100907. [44, 53]
- Samuelson, Paul. 1937. "A Note on Measurement of Utility." Review of Economic Studies 4(2): 155-61. DOI: 10.2307/2967612. [54]
- Sims, Christopher A. 2003. "Implications of rational inattention." Journal of Monetary Economics 50(3): 665-90. DOI: 10.1016/S0304-3932(03)00029-1. [36]
- Sullivan, Paul. 2016. "Fresh Thinking on Saving." New York Times (New York edition), March 27, 2016: F2. URL: http://nytimes.com/2016/03/27/your-money/getting-workers-tosave-more-for-retirement.html. [35]
- Taubinsky, Dmitry. 2014. "From Intentions to Actions: A Model and Experimental Evidence of Inattentive Choice." Working paper. Hanover, NH, USA: Dartmouth College. URL: https://docs.google.com/viewer?a=v&pid=sites&srcid= ZGVmYXVsdGRvbWFpbnxkbWl0cnlwYXBlcnN8Z3g6NmIzYWM0MWIwNTc4MjkwNQ. [36]
- Vosgerau, Joachim, Sabrina Bruyneel, Ravi Dhar, and Klaus Wertenbroch. 2008. "Ego Depletion and Cognitive Load: Same or Different Constructs?" In Advances in Consumer Research. Vol. 35, Association for Consumer Research, 217–20. URL: http://www.acrwebsite.org/ search/view-conference-proceedings.aspx?Id=13549. [54]
- Warner, John T., and Saul Pleeter. 2001. "The Personal Discount Rate: Evidence from Military Downsizing Programs." American Economic Review 91(1): 33-53. DOI: 10.1257/aer.91.1.33. [54]
- Yaari, Menahem E. 1965. "Uncertain Lifetime, Life Insurance, and the Theory of the Consumer." Review of Economic Studies 32 (2): 137-50. DOI: 10.2307/2296058. [54]

Chapter 3

Math Tests

3.1 Math Test Serif

3.1.1 Overview Serif

Default: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathnormal: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathrm: $a\alpha \alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathup: $a\alpha \alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathit: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbf: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbfit: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbfup: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$

Default: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathnormal: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathrm: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathup: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathit: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbf: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbfit: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbfit: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbfup: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$

Default: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathnormal: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathrm: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathup: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathit: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbf: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbfit: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbfit: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbfit: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$

3.1.2 Formulas Serif

 α , β , γ , δ , ϵ , ζ , η , θ , ι , κ , λ , μ , ν , ξ , o, π , ρ , σ , ς , τ , υ , ϕ , χ , ψ , ω , ε , A, B, Γ , Δ , E, Z, H, Θ , I, K, Λ , M, N, Ξ , O, Π , P, Σ , T, Υ , Φ , X, Ψ , Ω , F,

 α , β , γ , δ , ϵ , ζ , η , θ , ι , κ , λ , μ , ν , ξ , o, π , ρ , σ , ζ , τ , v, ϕ , χ , ψ , ω , ϵ , A, B, Γ , Δ , E, Z, H, Θ , I, K, Λ , M, N, Ξ , O, Π , P, Σ , T, Υ , Φ , X, Ψ , Ω , F,

 α , β , γ , δ , ε , ζ , η , θ , ι , κ , λ , μ , ν , ξ , o, π , ρ , σ , ς , τ , υ , ϕ , χ , ψ , ω , ε , A, B, Γ , Δ , E, Z, H, Θ , I, K, Λ , M, N, Ξ , O, Π , P, Σ , T, Y, Φ , X, Ψ , Ω , ε ,

 α , β , γ , δ , ϵ , ζ , η , θ , ι , κ , λ , μ , ν , ξ , o, π , ρ , σ , ς , τ , υ , ϕ , χ , ψ , ω , ϵ , A, B, Γ , Δ , E, Z, H, Θ , I, K, Λ , M, N, Ξ , O, Π , P, Σ , T, Y, Φ , X, Ψ , Ω , F,

 $\alpha a > 0$, $\beta b + (3 \times 27)$, $\Gamma G = 7 < 8$, λ $\alpha a > 0$, $\beta b + (3 \times 27)$, $\Gamma G = 7 < 8$, λ $s \pm 3\gamma + y - 1 = 4 \times 7$ $\hat{\beta} = (X'X)^{-1}X'y$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

$$s \pm 3\gamma + y - 1 \times 7$$
$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

$$s \pm 3\gamma + y - 1 \times 7$$
$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

$$s \pm 3\gamma + y - 1 \times 7$$
$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

3.1.3 Math Alphabets Serif

Default

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z,a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, \Upsilon, \Phi, X, \Psi, \Omega,$ $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \nu, \phi, \chi, \psi, \omega, \epsilon, \vartheta, \varpi, \rho, \zeta, \varphi,$

Math Normal (\mathnormal)

$$\begin{aligned} &0,1,2,3,4,5,6,7,8,9,\\ &A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z,\\ &a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z,\\ &A,B,\Gamma,\Delta,E,Z,H,\Theta,I,K,\Lambda,M,N,\Xi,O,\Pi,P,\Sigma,T,\Upsilon,\Phi,X,\Psi,\Omega,\\ &\alpha,\beta,\gamma,\delta,\epsilon,\zeta,\eta,\theta,\iota,\kappa,\lambda,\mu,\nu,\xi,o,\pi,\rho,\sigma,\tau,\upsilon,\phi,\chi,\psi,\omega,\epsilon,\vartheta,\varpi,\varrho,\varsigma,\varphi,\end{aligned}$$

Math Italic (\mathit)

$$0,1,2,3,4,5,6,7,8,9,$$
 $A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z,$
 $a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z,$
 $A,B,`,`,E,Z,H,`,I,K,`,M,N,`,O,",P,`,T,`,`,X,^-,`,$
 $\alpha,\beta,\gamma,\delta,\epsilon,\zeta,\eta,\theta,\iota,\kappa,\lambda,\mu,\nu,\xi,o,\pi,\rho,\sigma,\tau,\nu,\phi,\chi,\psi,\omega,\epsilon,\vartheta,\varpi,\rho,\varsigma,\varphi,$

Math Roman (\mathrm)

0,1,2,3,4,5,6,7,8,9,
A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z,
a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z,
A,B,Γ,Δ,E,Z,H,Θ,I,K,Λ,M,N,Ξ,Ο,Π,P,Σ,T,Υ,Φ,X,Ψ,Ω,

$$\alpha,\beta,\gamma,\delta,\epsilon,\zeta,\eta,\theta,\iota,\kappa,\lambda,\mu,\nu,\xi,o,\pi,\rho,\sigma,\tau,\nu,\phi,\chi,\psi,\omega,\epsilon,\vartheta,\varpi,\rho,\varsigma,\varphi,$$

Math Bold (\mathbf)

$$0,1,2,3,4,5,6,7,8,9,$$

$$A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z,$$

$$a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z,$$

$$A,B,\Gamma,\Delta,E,Z,H,\Theta,I,K,\Lambda,M,N,\Xi,O,\Pi,P,\Sigma,T,\Upsilon,\Phi,X,\Psi,\Omega,$$

$$\alpha,\beta,\gamma,\delta,\epsilon,\zeta,\eta,\theta,\iota,\kappa,\lambda,\mu,\nu,\xi,o,\pi,\rho,\sigma,\tau,\upsilon,\phi,\chi,\psi,\omega,\epsilon,\vartheta,\varpi,\rho,\varsigma,\varphi,$$

Caligraphic (\mathcal)

$$\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}, \mathcal{E}, \mathcal{F}, \mathcal{G}, \mathcal{H}, \mathcal{I}, \mathcal{I}, \mathcal{X}, \mathcal{L}, \mathcal{M}, \mathcal{N}, \mathcal{O}, \mathcal{P}, \mathcal{Q}, \mathcal{R}, \mathcal{F}, \mathcal{T}, \mathcal{U}, \mathcal{V}, \mathcal{W}, \mathcal{X}, \mathcal{Y}, \mathcal{Z}, \mathcal{Z}$$

Script (\mathscr)

$$\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}, \mathcal{E}, \mathcal{F}, \mathcal{G}, \mathcal{H}, \mathcal{I}, \mathcal{I}, \mathcal{K}, \mathcal{L}, \mathcal{M}, \mathcal{N}, \mathcal{O}, \mathcal{P}, \mathcal{Q}, \mathcal{R}, \mathcal{S}, \mathcal{T}, \mathcal{U}, \mathcal{V}, \mathcal{W}, \mathcal{X}, \mathcal{Y}, \mathcal{Z}, \mathcal{Y}, \mathcal{Z}, \mathcal{Y}, \mathcal{Z}, \mathcal{Y}, \mathcal{Z}, \mathcal{Z}$$

Fraktur (\mathfrak)

$$\mathfrak{A}, \mathfrak{B}, \mathfrak{C}, \mathfrak{D}, \mathfrak{E}, \mathfrak{F}, \mathfrak{G}, \mathfrak{H}, \mathfrak{I}, \mathfrak{J}, \mathfrak{K}, \mathfrak{L}, \mathfrak{M}, \mathfrak{N}, \mathfrak{D}, \mathfrak{P}, \mathfrak{Q}, \mathfrak{R}, \mathfrak{S}, \mathfrak{T}, \mathfrak{U}, \mathfrak{V}, \mathfrak{W}, \mathfrak{X}, \mathfrak{Y}, \mathfrak{Z}, \mathfrak{a}, \mathfrak{b}, \mathfrak{c}, \mathfrak{d}, \mathfrak{e}, \mathfrak{f}, \mathfrak{g}, \mathfrak{h}, \mathfrak{i}, \mathfrak{j}, \mathfrak{k}, \mathfrak{l}, \mathfrak{m}, \mathfrak{n}, \mathfrak{o}, \mathfrak{p}, \mathfrak{q}, \mathfrak{r}, \mathfrak{s}, \mathfrak{t}, \mathfrak{u}, \mathfrak{v}, \mathfrak{w}, \mathfrak{x}, \mathfrak{y}, \mathfrak{z},$$

Blackboard Bold (\mathbb)

$$A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z,$$

3.1.4 Character Sidebearings Serif

$$|A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + |a| $

Math Roman (\mathrm)

$$\begin{aligned} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |\Gamma| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |\Lambda| + |M| + \\ |N| + |\Xi| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |\Upsilon| + |\Phi| + |X| + |\Psi| + |\Omega| + \end{aligned}$$

Math Bold (\mathbf)

$$\begin{aligned} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |T| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |A| + |M| + \\ |N| + |\Xi| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |\Upsilon| + |\Phi| + |X| + |\Psi| + |\Omega| + \end{aligned}$$

Math Calligraphic (\mathcal)

$$\begin{aligned} |\mathcal{A}| + |\mathcal{B}| + |\mathcal{C}| + |\mathcal{D}| + |\mathcal{E}| + |\mathcal{F}| + |\mathcal{G}| + |\mathcal{H}| + |\mathcal{I}| + |\mathcal{I}| + |\mathcal{H}| +$$

3.1.5 Superscript Positioning Serif

$$\begin{array}{l} A^2+B^2+C^2+D^2+E^2+F^2+G^2+H^2+I^2+J^2+K^2+L^2+M^2+\\ N^2+O^2+P^2+Q^2+R^2+S^2+T^2+U^2+V^2+W^2+X^2+Y^2+Z^2+\\ a^2+b^2+c^2+d^2+e^2+f^2+g^2+h^2+i^2+j^2+k^2+l^2+m^2+\\ n^2+o^2+p^2+q^2+r^2+s^2+t^2+u^2+v^2+w^2+x^2+y^2+z^2+\\ A^2+B^2+\Gamma^2+\Delta^2+E^2+Z^2+H^2+\Theta^2+I^2+K^2+\Lambda^2+M^2+\\ N^2+\Xi^2+O^2+\Pi^2+P^2+\Sigma^2+T^2+\Upsilon^2+\Phi^2+X^2+\Psi^2+\Omega^2+\\ a^2+\beta^2+\gamma^2+\delta^2+e^2+\zeta^2+\eta^2+\theta^2+\iota^2+\kappa^2+\lambda^2+\mu^2+\\ v^2+\xi^2+o^2+\pi^2+\rho^2+\sigma^2+\tau^2+v^2+\phi^2+\chi^2+\psi^2+\omega^2+\\ \varepsilon^2+\vartheta^2+\sigma^2+\rho^2+\zeta^2+\varphi^2+\end{array}$$

Math Roman (\mathrm)

$$\begin{split} &A^2+B^2+C^2+D^2+E^2+F^2+G^2+H^2+I^2+J^2+K^2+L^2+M^2+\\ &N^2+O^2+P^2+Q^2+R^2+S^2+T^2+U^2+V^2+W^2+X^2+Y^2+Z^2+\\ &a^2+b^2+c^2+d^2+e^2+f^2+g^2+h^2+i^2+j^2+k^2+I^2+m^2+\\ &n^2+o^2+p^2+q^2+r^2+s^2+t^2+u^2+v^2+w^2+x^2+y^2+z^2+\\ &A^2+B^2+\Gamma^2+\Delta^2+E^2+Z^2+H^2+\Theta^2+I^2+K^2+\Lambda^2+M^2+\\ &N^2+\Xi^2+O^2+\Pi^2+P^2+\Sigma^2+T^2+\Upsilon^2+\Phi^2+X^2+\Psi^2+\Omega^2+\\ \end{split}$$

Math Bold (\mathbf)

$$A^{2} + B^{2} + C^{2} + D^{2} + E^{2} + F^{2} + G^{2} + H^{2} + I^{2} + J^{2} + K^{2} + L^{2} + M^{2} + N^{2} + O^{2} + P^{2} + Q^{2} + R^{2} + S^{2} + T^{2} + U^{2} + V^{2} + W^{2} + X^{2} + Y^{2} + Z^{2} + G^{2} + G^{2$$

Math Calligraphic (\mathcal)

$$\mathcal{A}^{2} + \mathcal{B}^{2} + \mathcal{C}^{2} + \mathcal{D}^{2} + \mathcal{E}^{2} + \mathcal{F}^{2} + \mathcal{L}^{2} + \mathcal{M}^{2} + \mathcal{L}^{2} + \mathcal{M}^{2} + \mathcal{L}^{2} + \mathcal{D}^{2} $

3.1.6 Subscript Positioning Serif

$$\begin{split} A_i + B_i + C_i + D_i + E_i + F_i + G_i + H_i + I_i + J_i + K_i + L_i + M_i + \\ N_i + O_i + P_i + Q_i + R_i + S_i + T_i + U_i + V_i + W_i + X_i + Y_i + Z_i + \\ a_i + b_i + c_i + d_i + e_i + f_i + g_i + h_i + i_i + j_i + k_i + l_i + m_i + \\ n_i + o_i + p_i + q_i + r_i + s_i + t_i + u_i + v_i + w_i + x_i + y_i + z_i + \\ A_i + B_i + \Gamma_i + \Delta_i + E_i + Z_i + H_i + \Theta_i + I_i + K_i + \Lambda_i + M_i + \\ N_i + \Xi_i + O_i + \Pi_i + P_i + \Sigma_i + T_i + \Upsilon_i + \Phi_i + X_i + \Psi_i + \Omega_i + \\ \alpha_i + \beta_i + \gamma_i + \delta_i + \epsilon_i + \zeta_i + \eta_i + \theta_i + \iota_i + \kappa_i + \lambda_i + \mu_i + \\ v_i + \xi_i + o_i + \pi_i + \rho_i + \sigma_i + \tau_i + v_i + \phi_i + \chi_i + \psi_i + \omega_i + \\ \varepsilon_i + \vartheta_i + \varpi_i + \varrho_i + \varsigma_i + \varphi_i + \end{split}$$

Math Roman (\mathrm)

$$\begin{split} & A_i + B_i + C_i + D_i + E_i + F_i + G_i + H_i + I_i + J_i + K_i + L_i + M_i + \\ & N_i + O_i + P_i + Q_i + R_i + S_i + T_i + U_i + V_i + W_i + X_i + Y_i + Z_i + \\ & a_i + b_i + c_i + d_i + e_i + f_i + g_i + h_i + i_i + j_i + k_i + l_i + m_i + \\ & n_i + o_i + p_i + q_i + r_i + s_i + t_i + u_i + v_i + w_i + x_i + y_i + z_i + \\ & A_i + B_i + \Gamma_i + \Delta_i + E_i + Z_i + H_i + \Theta_i + I_i + K_i + \Lambda_i + M_i + \\ & N_i + \Xi_i + O_i + \Pi_i + P_i + \Sigma_i + T_i + \Upsilon_i + \Phi_i + X_i + \Psi_i + \Omega_i + \\ \end{split}$$

Math Bold (\mathbf)

$$\begin{aligned} &A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + \\ &N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + \\ &a_{i} + b_{i} + c_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + \\ &n_{i} + o_{i} + p_{i} + q_{i} + r_{i} + s_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + \\ &A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + \\ &N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + \Upsilon_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + \end{aligned}$$

Math Calligraphic (\mathcal)

$$\begin{aligned} \mathcal{A}_i + \mathcal{B}_i + \mathcal{C}_i + \mathcal{D}_i + \mathcal{E}_i + \mathcal{F}_i + \mathcal{G}_i + \mathcal{H}_i + \mathcal{J}_i + \mathcal{J}_i + \mathcal{H}_i + \mathcal{L}_i + \mathcal{M}_i + \\ \mathcal{N}_i + \mathcal{O}_i + \mathcal{P}_i + \mathcal{Q}_i + \mathcal{R}_i + \mathcal{S}_i + \mathcal{T}_i + \mathcal{U}_i + \mathcal{V}_i + \mathcal{W}_i + \mathcal{X}_i + \mathcal{Y}_i + \mathcal{Z}_i + \end{aligned}$$

3.1.7 Accent Positioning Serif

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{i} + \hat{j} + \hat{k} + \hat{l} + \hat{m} + \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{\Theta} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{\Upsilon} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} + \\ \hat{a} + \hat{\beta} + \hat{\gamma} + \hat{\delta} + \hat{e} + \hat{\xi} + \hat{\gamma} + \hat{\theta} + \hat{t} + \hat{\kappa} + \hat{\lambda} + \hat{\mu} + \\ \hat{v} + \hat{\xi} + \hat{o} + \hat{\pi} + \hat{\rho} + \hat{\sigma} + \hat{\tau} + \hat{v} + \hat{\phi} + \hat{\chi} + \hat{\psi} + \hat{\omega} + \\ \hat{\varepsilon} + \hat{\vartheta} + \hat{\varpi} + \hat{\rho} + \hat{\varsigma} + \hat{\varsigma} + \hat{\varphi} +$$

Math Italic (\mathit)

Math Roman (\mathrm)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{i} + \hat{j} + \hat{k} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{\Theta} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{\Upsilon} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} +$$

Math Bold (\mathbf)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{i} + \hat{j} + \hat{k} + \hat{l} + \hat{m} + \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{\Theta} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{T} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} +$$

$$\hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{J} + \hat{J} + \hat{X} + \hat{L} + \hat{M} + \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{P} + \hat{P} + \hat{Q} + \hat{R} + \hat{P} + \hat{P} + \hat{Q} + \hat{R} + \hat{P} + \hat{P} + \hat{Q} + \hat{P} + \hat{Q} + \hat{P} + \hat{Q} + \hat{P} + \hat{Q} + \hat{P} + \hat{P} + \hat{Q} +$$

3.1.8 Differentials Serif

```
dA + dB + dC + dD + dE + dF + dG + dH + dI + dJ + dK + dL + dM +
dN + dO + dP + dQ + dR + dS + dT + dU + dV + dW + dX + dY + dZ +
da + db + dc + dd + de + df + dg + dh + di + dj + dk + dl + dm +
dn + do + dp + dq + dr + ds + dt + du + dv + dw + dx + dy + dz +
dA + dB + d\Gamma + d\Delta + dE + dZ + dH + d\Theta + dI + dK + d\Lambda + dM +
dN + d\Xi + dO + d\Pi + dP + d\Sigma + dT + d\Upsilon + d\Phi + dX + d\Psi + d\Omega +
d\alpha + d\beta + d\gamma + d\delta + d\epsilon + d\zeta + d\eta + d\theta + d\iota + d\kappa + d\lambda + d\mu +
dv + d\xi + do + d\pi + d\rho + d\sigma + d\tau + dv + d\phi + d\chi + d\psi + d\omega +
d\varepsilon + d\vartheta + d\varpi + d\varrho + d\varsigma + d\varphi +
dN + d\Xi + dO + d\Pi + dP + d\Sigma + dT + d\Upsilon + d\Phi + dX + d\Psi + d\Omega +
```

```
dA + dB + dC + dD + dE + dF + dG + dH + dI + dJ + dK + dL + dM +
dN + dO + dP + dQ + dR + dS + dT + dU + dV + dW + dX + dY + dZ +
da + db + dc + dd + de + df + dg + dh + di + dj + dk + dl + dm +
dn + do + dp + dq + dr + ds + dt + du + dv + dw + dx + dy + dz +
dA + dB + d\Gamma + d\Delta + dE + dZ + dH + d\Theta + dI + dK + d\Lambda + dM +
dN + d\Xi + dO + d\Pi + dP + d\Sigma + dT + d\Upsilon + d\Phi + dX + d\Psi + d\Omega +
d\alpha + d\beta + d\gamma + d\delta + d\epsilon + d\zeta + d\eta + d\theta + d\iota + d\kappa + d\lambda + d\mu +
dv + d\xi + do + d\pi + d\rho + d\sigma + d\tau + dv + d\phi + d\chi + d\psi + d\omega +
d\varepsilon + d\vartheta + d\varpi + d\varrho + d\zeta + d\varphi +
dA + dB + d\Gamma + d\Delta + dE + dZ + dH + d\Theta + dI + dK + d\Lambda + dM +
dN + d\Xi + dO + d\Pi + dP + d\Sigma + dT + d\Upsilon + d\Phi + dX + d\Psi + d\Omega +
```

```
\begin{split} \partial A + \partial B + \partial C + \partial D + \partial E + \partial F + \partial G + \partial H + \partial I + \partial J + \partial K + \partial L + \partial M + \\ \partial N + \partial O + \partial P + \partial Q + \partial R + \partial S + \partial T + \partial U + \partial V + \partial W + \partial X + \partial Y + \partial Z + \\ \partial a + \partial b + \partial c + \partial d + \partial e + \partial f + \partial g + \partial h + \partial i + \partial j + \partial k + \partial l + \partial m + \\ \partial n + \partial o + \partial p + \partial q + \partial r + \partial s + \partial t + \partial u + \partial v + \partial w + \partial x + \partial y + \partial z + \\ \partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \\ \partial N + \partial \Xi + \partial O + \partial \Pi + \partial P + \partial \Sigma + \partial T + \partial \Upsilon + \partial \Phi + \partial X + \partial \Psi + \partial \Omega + \\ \partial \alpha + \partial \beta + \partial \gamma + \partial \delta + \partial \epsilon + \partial \zeta + \partial \eta + \partial \theta + \partial \iota + \partial \kappa + \partial \lambda + \partial \mu + \\ \partial \nu + \partial \xi + \partial o + \partial \pi + \partial \rho + \partial \sigma + \partial \tau + \partial v + \partial \phi + \partial \chi + \partial \psi + \partial \omega + \\ \partial \epsilon + \partial \vartheta + \partial \sigma + \partial \rho + \partial \zeta + \partial \Gamma ```

### 3.1.9 Slash Kerning Serif

```
 1/A + 1/B + 1/C + 1/D + 1/E + 1/F + 1/G + 1/H + 1/I + 1/J + 1/K + 1/L + 1/M + 1/N + 1/O + 1/P + 1/Q + 1/R + 1/S + 1/T + 1/U + 1/V + 1/W + 1/X + 1/Y + 1/Z + 1/a + 1/b + 1/c + 1/d + 1/e + 1/f + 1/g + 1/h + 1/i + 1/j + 1/k + 1/l + 1/m + 1/n + 1/o + 1/p + 1/q + 1/r + 1/s + 1/t + 1/u + 1/v + 1/w + 1/x + 1/y + 1/z + 1/A + 1/B + 1/\Gamma + 1/\Delta + 1/E + 1/Z + 1/H + 1/\Theta + 1/I + 1/K + 1/\Lambda + 1/M + 1/N + 1/\Xi + 1/O + 1/\Pi + 1/P + 1/\Sigma + 1/T + 1/\Gamma ```

 $A/2 + B/2 + C/2 + D/2 + E/2 + F/2 + G/2 + H/2 + I/2 + J/2 + K/2 + L/2 + M/2 + N/2 + O/2 + P/2 + Q/2 + R/2 + S/2 + T/2 + U/2 + V/2 + W/2 + X/2 + Y/2 + Z/2 + a/2 + b/2 + c/2 + d/2 + e/2 + f/2 + g/2 + h/2 + i/2 + j/2 + k/2 + l/2 + m/2 + n/2 + o/2 + p/2 + q/2 + r/2 + s/2 + t/2 + u/2 + v/2 + w/2 + x/2 + y/2 + z/2 + A/2 + B/2 + \Gamma/2 + \Delta/2 + E/2 + Z/2 + H/2 + \Theta/2 + I/2 + K/2 + \Lambda/2 + M/2 + N/2 + E/2 + O/2 + \Pi/2 + P/2 + E/2 + T/2 + T/2 + \Phi/2 + X/2 + \Psi/2 + \Omega/2 + a/2 + \beta/2 + \gamma/2 + \delta/2 + e/2 + \zeta/2 + \eta/2 + \theta/2 + \iota/2 + \kappa/2 + \lambda/2 + \mu/2 + v/2 + \xi/2 + o/2 + \pi/2 + \rho/2 + \sigma/2 + \tau/2 + v/2 + \phi/2 + \chi/2 + \psi/2 + \omega/2 + \varepsilon/2 + \vartheta/2 + \varpi/2 + g/2 + g/2 + \varphi/2 + \psi/2 + \psi/2 + \omega/2 + \omega/2 + \omega/2 + \omega/2 + \omega/2 + \varphi/2 + \omega/2 + \varphi/2 + \varphi/2 + \omega/2 + \varphi/2 + \psi/2 + \omega/2 + \omega/2 + \psi/2 + \psi/2 + \omega/2 + \psi/2 + \psi/2 + \omega/2 + \psi/2

3.1.10 Big Operators Serif

$$\sum_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n} \int_{i=1}^{n} x^{n} \oint_{i=1}^{n} x^{n}$$

$$\bigotimes_{i=1}^{n} x^{n} \bigoplus_{i=1}^{n} x^{n} \bigwedge_{i=1}^{n} x^{n} \bigvee_{i=1}^{n} x^{n} \bigoplus_{i=1}^{n} x^{n} \bigcup_{i=1}^{n} x^{n} \bigcap_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n}$$

3.1.11 Radicals Serif

$$\sqrt{x+y} \qquad \sqrt{x^2+y^2} \qquad \sqrt{x_i^2+y_j^2} \qquad \sqrt{\left(\frac{\cos x}{2}\right)} \qquad \sqrt{\left(\frac{\sin x}{2}\right)}$$

$$\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{x+y}}}}}}}$$

3.1.12 Over- and Underbraces Serif

$$x \longrightarrow x + y \longrightarrow x^2 + y^2 \longrightarrow x_i^2 + y_j^2 \longrightarrow x \longrightarrow x + y \longrightarrow x_i + y_j \longrightarrow x_i^2 + y_j^2$$

3.1.13 Normal and Wide Accents Serif

$$\dot{x}$$
 \ddot{x} \ddot{x} \bar{x} \bar{x}

3.1.14 Long Arrows Serif

3.1.15 Left and Right Delimiters Serif

$$-(f) - -[f] - -|f| - -[f] - -\langle f \rangle - -\{f\} -$$

Using \left and \right.

$$-\big(f\big)--[f]--|f|--[f]--\langle f\rangle--\{f\}-$$

$$- \big) \! f \big(-- \big) \! f \big(--/f/-- \big) \! f \big\backslash --/f \big\backslash -- \big\backslash f/-$$

3.1.16 Big-g-g Delimiters Serif

3.1.17 Binary Operators Serif

3.1.18 Relations Serif

```
x \leq y
          \leq
                                        \geq
                                                                      \equiv
                                                                                   x \models y
                                                                                             \models
                             x \ge y
                                                           x \equiv y
                                                                      \sim
                                                                                   x \perp y
x \prec y
          \prec
                             x \succ y
                                        \succ
                                                           x \sim y
                                                                                             \perp
x \leq y
          \preceq
                                        \succeq
                                                                      \simeq
                                                                                   x \mid y
                                                                                             \mid
                             x \succeq y
                                                           x \simeq y
                                                                                             \parallel
x \ll y \setminus 11
                                                           x \times y
                                                                      \asymp
                                                                                   x \parallel y
                             x \gg y \setminus gg
                                                                                   x \bowtie y \bowtie
x \subset y
          \subset
                                                                      \approx
                             x\supset y
                                        \supset
                                                           x \approx y
x \subseteq y
          \subseteq
                             x \supseteq y
                                        \supseteq
                                                           x \cong y
                                                                     \cong
                                                                                   x \bowtie y
                                                                                             \Join
         \sqsubset
                                                                                   x \smile y \setminus \text{smile}
x \sqsubset y
                             x \supset y
                                       \sqsupset
                                                           x \neq y
                                                                     \neq
                                                                                   x - y \setminus frown
x \sqsubseteq y
          \sqsubseteq
                             x \supseteq y
                                        \sqsupseteq
                                                           x \doteq y
                                                                      \doteq
x \in y
          \in
                                        \ni
                                                                     \propto
                             x \ni y
                                                           x \propto y
                                                                                   x = y
x \vdash y
          \vdash
                             x \dashv y
                                        \dashv
                                                           x < y
                                                                      <
                                                                                   x > y >
x:y
```

3.1.19 Punctuation Serif

```
x:y \setminus colon x.y \setminus ldotp x\cdot y \setminus cdotp
x,y,
                   x;y;
```

3.1.20 Arrows Serif

```
x \leftarrow y
           \leftarrow
                                            x \leftarrow y
                                                         \longleftarrow
                                                                                                       \uparrow
                                                                                            x \uparrow y
           \Leftarrow
                                                          \Longleftarrow
x \Leftarrow y
                                            x \longleftarrow y
                                                                                            x \uparrow y
                                                                                                       \Uparrow
x \rightarrow y
           \rightarrow
                                            x \longrightarrow y
                                                          \longrightarrow
                                                                                            x \downarrow y
                                                                                                       \downarrow
           \Rightarrow
                                                         \Longrightarrow
                                                                                            x \downarrow y
                                                                                                       \Downarrow
x \Rightarrow y
                                            x \Longrightarrow y
x \longleftrightarrow y \setminus leftrightarrow
                                            x \longleftrightarrow y
                                                         \longleftrightarrow
                                                                                            x \uparrow y
                                                                                                       \updownarrow
x \Leftrightarrow y \setminus \text{Leftrightarrow}
                                            x \Longleftrightarrow y \setminus Longleftrightarrow
                                                                                                       \Updownarrow
                                                                                            x \updownarrow y
                                                          \longmapsto
x \mapsto y
           \mapsto
                                                                                            x \nearrow y \setminus \text{nearrow}
                                            x \longmapsto y
x \leftarrow y
           \hookleftarrow
                                            x \hookrightarrow y
                                                          \hookrightarrow
                                                                                            x \searrow y \searrow
x \leftarrow y
           \leftharpoonup
                                            x \rightarrow y
                                                          \rightharpoonup
                                                                                            x ✓ y \swarrow
           \leftharpoondown
                                                          \rightharpoondown
                                                                                            x \setminus y \setminus \text{nwarrow}
x \leftarrow y
                                            x \rightarrow y
x \rightleftharpoons y
           \rightleftharpoons
                                            x \rightsquigarrow y
                                                          \leadsto
```

3.1.21 Miscellaneous Symbols Serif

```
x \cdot \cdot \cdot y
          \ldots
                       x \cdots y
                                  \cdots
                                                   x:y
                                                            \vdots
                                                                                          \ddots
x...y
x \aleph y
          \aleph
                                  \prime
                                                   x \forall y
                                                            \forall
                                                                                          \infty
                       x/y
                                                                               x \infty y
хћу
          \hbar
                       x \emptyset y
                                  \emptyset
                                                   x\exists y
                                                            \exists
                                                                               x\Box y
                                                                                          \Box
          \imath
                       x\nabla y
хıу
                                  \nabla
                                                            \neg
                                                                               x \Diamond y
                                                                                          \Diamond
                                                   x\neg y
          \jmath
                       x\sqrt{y}
                                  \surd
                                                   x by
                                                            \flat
                                                                               x \triangle y
                                                                                          \triangle
x_{J}y
x\ell y
          \ell
                       x T y
                                  \top
                                                            \natural
                                                                               x♣y
                                                                                          \clubsuit
                                                   x 
abla y
                       x \perp y
                                                                                          \diamondsuit
x \wp y
          \wp
                                  \bot
                                                   x \sharp y
                                                            \sharp
                                                                               x \diamondsuit y
                       x||y
                                                                                          \heartsuit
x\Re y
          \Re
                                  \backslash \bot
                                                   x \setminus y
                                                            \backslash
                                                                               x \nabla y
                                                                                          \spadesuit
x\Im y
          \Im
                       x \angle y
                                  \angle
                                                   x \partial y
                                                            \partial
                                                                               x \spadesuit y
х℧у
          \mho
                                                                                          !
                       x.y
                                                   x|y
                                                                               x!y
```

3.1.22 Variable-Sized Operators Serif

```
x \sum y
         \sum
                      x \cap y \setminus bigcap
                                              x \odot y
                                                        \bigodot
x \prod y
                                                        \bigotimes
         \prod
                      x[]y
                              \bigcup
                                              x \otimes y
x | y
                      x \mid y
         \coprod
                              \bigsqcup
                                              x \bigoplus y
                                                        \bigoplus
                      x \bigvee y
x \mid y
         \int
                              \bigvee
                                              x + y
                                                        \biguplus
                              \bigwedge
x \phi y
         \oint
                      x \wedge y
```

3.1.23 Log-Like Operators Serif

```
x arccos y
              x \cos y
                         x \csc y
                                     x \exp y
                                                 xkery
                                                               x \lim \sup y
                                                                             x \min y
                                                                                         x \sinh y
x arcsin y
              x \cosh y
                         x \deg y
                                     x \gcd y
                                                 x \log y
                                                               x \ln y
                                                                             x Pry
                                                                                         x supy
x arctany
              x \cot y
                          x \det y
                                     x hom y
                                                x \lim y
                                                               x \log y
                                                                             x \sec y
                                                                                         x tany
              x coth y
x argy
                         x \dim y
                                     x \inf y
                                                 x \lim \inf y
                                                               x \max y
                                                                             x \sin y
                                                                                         x tanh y
```

3.1.24 Delimiters Serif

```
x(y)
      (
                     x)y
                                           x \uparrow y
                                                    \uparrow
                                                                          x \uparrow y
                                                                                   \Uparrow
       [
                             ]
x[y]
                     x]y
                                           x \downarrow y
                                                    \downarrow
                                                                          x \downarrow y
                                                                                   \Downarrow
x{y}
      \{
                     x}y
                             \}
                                           x \uparrow y
                                                    \updownarrow
                                                                          x \updownarrow y
                                                                                   \Updownarrow
x|y
       \lfloor
                     x|y
                             \rfloor
                                           x[y]
                                                    \lceil
                                                                          x]y
                                                                                   \rceil
x\langle y
       \langle
                     x\rangle y
                             \rangle
                                           x/y
                                                                          x \setminus y
                                                                                   \backslash
x|y
                     x||y
                             \backslash |
```

3.1.25 Large Delimiters Serif

```
\rmoustache \int \lmoustache \int \rmoup \rgroup \rgroup \lmoustache \rightarrowvert \rig
```

3.1.26 Math Mode Accents Serif

```
\hat{a} \hat{a} \acute{a} \acute{a} \bar{a} \bar{a} \acute{a} \dot{a} \breve{a} \breve{a} \check{a} \check{a} \grave{a} \grave{a} \vec{a} \vec{a} \ddot{a} \dot{a} \tilde{a} \tilde{a}
```

3.1.27 Miscellaneous Constructions Serif

```
\widetilde{abc}
abc
                                abc
                                        \widehat{abc}
abc
       \overleftarrow{abc} \overrightarrow{abc}
                                        \overrightarrow{abc}
abc
       \overline{abc}
                                        \underline{abc}
                                abc
abc`
       \overbrace{abc}
                                        \underbrace{abc}
                                 abc
                                 \sqrt[n]{abc}
\sqrt{abc}
                                        \sqrt[n]{abc}
       \sqrt{abc}
                                 abc
xyz
       f'
f'
                                        \frac{abc}{xyz}
```

3.1.28 AMS Delimiters Serif

 $x^{T}y$ \ullcorner $x^{T}y$ \urlcorner $x_{\perp}y$ \llcorner $x_{\perp}y$ \llcorner

3.1.29 AMS Arrows Serif

$x \longrightarrow y$	\dashrightarrow	<i>x</i> ← <i>y</i>	\dashleftarrow
$x \not\models y$	\leftleftarrows	$x \leftrightarrows y$	\leftrightarrows
$x \in y$	\Lleftarrow	$x \leftarrow y$	\twoheadleftarrow
$x \leftarrow y$	\leftarrowtail	$x \notin y$	\looparrowleft
$x \leftrightharpoons y$	\leftrightharpoons	$x \cap y$	\curvearrowleft
$x \circlearrowleft y$	\circlearrowleft	$x \uparrow y$	\Lsh
$x \uparrow \uparrow y$	\upuparrows	$x \mid y$	\upharpoonleft
$x \downarrow y$	\downharpoonleft	$x \rightarrow y$	\multimap
$x \leftrightarrow y$	\leftrightsquigarrow	$x \rightrightarrows y$	\rightrightarrows
$x \rightleftharpoons y$	\rightleftarrows	$x \rightrightarrows y$	\rightrightarrows
$x \rightleftharpoons y$	\rightleftarrows	$x \rightarrow y$	\twoheadrightarrow
$x \mapsto y$	\rightarrowtail	$x \rightarrow y$	\looparrowright
$x \rightleftharpoons y$	\rightleftharpoons	$x \cap y$	\curvearrowright
$x \circlearrowleft y$	\circlearrowright	x ightharpoonup y	\Rsh
$x \downarrow \downarrow y$	\downdownarrows	$x \upharpoonright y$	\upharpoonright
$x \mid y$	\downharpoonright	$x \leadsto y$	\rightsquigarrow

3.1.30 AMS Negated Arrows Serif

```
x \nleftrightarrow y \nleftarrow x \nleftrightarrow y \nrightarrow x \nleftrightarrow y \nRightarrow x \nleftrightarrow y \nleftrightarrow x \nleftrightarrow y \nleftrightarrow
```

3.1.31 AMS Greek Serif

 $x \in \mathcal{Y} \setminus \text{digamma} x \in \mathcal{X} \mathcal{Y} \setminus \text{varkappa}$

3.1.32 AMS Hebrew Serif

 $x \exists y \ \text{beth} \ x \exists y \ \text{gimel}$

3.1.33 AMS Miscellaneous Serif

хћу	\hbar	хћу	\hslash				
$x \triangle y$	\vartriangle	$x \nabla y$	\triangledown				
$x\Box y$	\square	$x \Diamond y$	\lozenge				
xSy	\circledS	x∠y	\angle				
x∡y	\measuredangle	<i>x</i> ∄ <i>y</i>	\nexists				
x $\mho y$	\mho	$x \pm y$	\Finv ^u				
x $\ni y$	\Game ^u	x k y	\Bbbk ^u				
<i>x</i> \ <i>y</i>	\backprime	хØу	\varnothing				
$x \blacktriangle y$	\blacktriangle	$x \nabla y$	\blacktriangledown				
<i>x</i> ■ <i>y</i>	\blacksquare	<i>x</i> ♦ <i>y</i>	\blacklozenge				
$x \bigstar y$	\bigstar	x∢y	\sphericalangle				
xl y	\complement	хðу	\eth				
x/y	$ackslash ext{diagup}^u$	$x \setminus y$	\diagdown ^u				
$^{\it u}$ Not defined in amssymb.sty, define using the \newsymbol command.							

3.1.34 AMS Binary Operators Serif

x + y	\dotplus	20 > 10	\smallsetminus
x + y	docptus	$x \setminus y$	\Sind ((Se till I i i u s
$x \cap y$	\Cap	$x \cup y$	\Cup
$x \overline{\wedge} y$	\barwedge	$x \veebar y$	\veebar
$x \overline{\wedge} y$	\doublebarwedge	$x \boxminus y$	\boxminus
$x \boxtimes y$	\boxtimes	$x \boxdot y$	\boxdot
$x \boxplus y$	\boxplus	x * y	\divideontimes
$x \ltimes y$	\ltimes	$x \rtimes y$	\rtimes
$x \setminus y$	\leftthreetimes	$x \angle y$	\rightthreetimes
$x \curlywedge y$	\curlywedge	$x \land y$	\curlyvee
$x \ominus y$	\circleddash	$x \otimes y$	\circledast
$x \odot y$	\circledcirc	$x \cdot y$	\centerdot
x T y	\intercal		

3.1.35 AMS Relations Serif

- $x \leq y$ \leqslant
- $x \lesssim y$ \lesssim
- $x \cong y$ \approxeq
- $x \ll y \setminus 1111$
- $x \leq y$ \lesseqgtr
- \doteqdot $x \doteq y$
- \fallingdotseq x = y
- \backsimeq $x \subseteq y$
- $x \subseteq y$ \Subset
- \preccurlyeq $x \leq y$
- $x \gtrsim y$ \precsim
- \vartriangleleft $x \triangleleft y$
- $x \models y$ \vDash
- \smallsmile $x \smile y$
- x = y\bumpeq
- $x \ge y$ \geqq
- $x \geqslant y$ \eqslantgtr
- $x \gtrsim y$ \gtrapprox
- $x \gg y \setminus ggg$
- $x \ge y$ \gtreqless
- x = y\eqcirc
- $x \triangleq y$ \triangleq
- $x \approx y$ \thickapprox
- $x \ni y$ \Supset
- \succcurlyeq $x \geq y$
- $x \gtrsim y$ \succsim
- \vartriangleright $x \triangleright y$
- $x \Vdash y$ **\Vdash**
- \shortparallel $x \parallel y$
- $x \pitchfork y$ \pitchfork
- $x \triangleleft y$ \blacktriangleleft
- \backepsilon хэу
- \because x : y

3.1.36 AMS Negated Relations Serif

$x \not< y$	\nless	$x \not\leq y$	\nleq
$x \not\leq y$	\nleqslant	$x \not \leq y$	\nleqq
$x \leq y$	\lneq	$x \nleq y$	\lneqq
$x \leq y$	\lvertneqq	$x \lesssim y$	\lnsim
$x \lessapprox y$	\lnapprox	$x \not\prec y$	\nprec
$x \not \leq y$	\npreceq	$x \not\supset y$	\precnsim
$x \not \gtrsim y$	\precnapprox	$x \nsim y$	\nsim
xiy	\nshortmid	$x \nmid y$	\nmid
$x \not\vdash y$	\nvdash	$x \not\models y$	\nvDash
$x \not = y$	\ntriangleleft	$x \not \triangleq y$	\ntrianglelefteq
$x \not\subseteq y$	\nsubseteq	$x \subsetneq y$	\subsetneq
$x \not\subseteq y$	\varsubsetneq	$x \not\subseteq y$	\subsetneqq
$x \not\subseteq y$	\varsubsetneqq		\ngtr
$x \not\geq y$	\ngeq	$x \not \geq y$	\ngeqslant
$x \not \geqq y$	\ngeqq	$x \geqslant y$	\gneq
$x \not\supseteq y$	\gneqq	$x \geqq y$	\gvertneqq
$x \gtrsim y$	\gnsim	$x \geq y$	\gnapprox
$x \not\succ y$	\nsucc	$x \not\succeq y$	\nsucceq
$x \not \sqsubseteq y$	\nsucceqq	$x \not\succsim y$	\succnsim
$x \geq y$	\succnapprox	$x \not\cong y$	\ncong
хиу	\nshortparallel	$x \not\parallel y$	\nparallel
$x \not\models y$	\nvDash	$x \not\Vdash y$	\nVDash
$x \not\triangleright y$	\ntriangleright	$x \not\trianglerighteq y$	\ntrianglerighteq
$x \not\supseteq y$	\nsupseteq	$x \not\supseteq y$	\nsupseteqq
$x \supsetneq y$	\supsetneq	$x \ni y$	\varsupsetneq
$x \supseteq y$	\supsetneqq	$x \not\supseteq y$	\varsupsetneqq

3.2 Math Test Serif Bold

3.2.1 Overview Serif Bold

Default: $aab\beta G\Gamma P\Pi \Sigma \sigma$ mathnormal: $aab\beta G\Gamma P\Pi \Sigma \sigma$ mathrm: $aaab\beta G\Gamma P\Pi \Sigma \sigma$ mathup: $aaab\beta G\Gamma P\Pi \Sigma \sigma$ mathit: $aab\beta G`P''`\sigma$ mathbf: $aab\beta G\Gamma P\Pi \Sigma \sigma$ mathbfit: $aab\beta G\Gamma P\Pi \Sigma \sigma$ mathbfup: $aab\beta G\Gamma P\Pi \Sigma \sigma$

Default: ααbβGΓΡΠΣσ

mathnormal: ααbβGΓΡΠΣσ mathrm: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathup: aαbβGΓΡΠΣσ mathit: ααbβGΓΡΠΣσ mathbf: ααbβGΓΡΠΣσ mathbfit: ααbβGΓΡΠΣσ mathbfup: aαbβGΓΡΠΣσ

Default: ααbβGΓΡΠΣσ mathnormal: ααbβGΓΡΠΣσ mathrm: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathup: aαbβGΓΡΠΣσ mathit: ααbβGΓΡΠΣσ mathbf: ααbβGΓΡΠΣσ mathbfit: ααbβGΓΡΠΣσ mathbfup: aαbβGΓΡΠΣσ

3.2.2 Formulas Serif Bold

 $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \zeta, \tau, \nu, \phi, \chi, \psi, \omega, \epsilon, A, B, \Gamma,$ Δ , E, Z, H, Θ , I, K, Λ , M, N, Ξ , O, Π , P, Σ , T, Υ , Φ , X, Ψ , Ω , F, $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \zeta, \tau, \nu, \phi, \chi, \psi, \omega, \epsilon, A, B, \Gamma,$ Δ , E, Z, H, Θ , I, K, Λ , M, N, Ξ , O, Π , P, Σ , T, Υ , Φ , X, Ψ , Ω , F, α , β , γ , δ , ϵ , ζ , η , θ , ι , κ , λ , μ , ν , ξ , σ , π , ρ , σ , ς , τ , υ , ϕ , χ , ψ , ω , ϵ , A, B, Γ , Δ , E, Z, H, Θ , I, K, Λ , M, $N, \Xi, O, \Pi, P, \Sigma, T, Y, \Phi, X, \Psi, \Omega, F,$ α , β , γ , δ , ϵ , ζ , η , θ , ι , κ , λ , μ , ν , ξ , σ , π , ρ , σ , ς , τ , υ , ϕ , χ , ψ , ω , ϵ , A, B, Γ , Δ , E, Z, H, Θ , I, K, Λ , M, $N, \Xi, O, \Pi, P, \Sigma, T, Y, \Phi, X, \Psi, \Omega, F,$ $\alpha a > 0, \beta b + (3 \times 27), \Gamma G = 7 < 8, \lambda$ $\alpha a > 0, \beta b + (3 \times 27), \Gamma G = 7 < 8, \lambda$ $s \pm 3\gamma + y - 1 = 4 \times 7$ $\hat{\beta} = (X'X)^{-1}X'y$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

$$s \pm 3\gamma + y - 1 \times 7$$

$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

$$s \pm 3\gamma + y - 1 \times 7$$
$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) dx = \left(\frac{27}{2}\right)$$

$$s \pm 3\gamma + y - 1 \times 7$$
$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

3.2.3 Math Alphabets Serif Bold

Default

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z,

a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z,

 $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, \Upsilon, \Phi, X, \Psi, \Omega,$

 $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, v, \phi, \chi, \psi, \omega, \epsilon, \vartheta, \varpi, \varrho, \varsigma, \varphi,$

Math Normal (\mathnormal)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z,

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z,

 $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, \Upsilon, \Phi, X, \Psi, \Omega,$

 $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, v, \phi, \chi, \psi, \omega, \epsilon, \vartheta, \varpi, \varrho, \varsigma, \varphi,$

Math Italic (\mathit)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z,a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z,A, B, `, ', E, Z, H, `, I, K, `, M, N, `, O, '', P, `, T, `, `, X, `, `, $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, v, \phi, \chi, \psi, \omega, \epsilon, \vartheta, \varpi, \varrho, \varsigma, \varphi,$

Math Roman (\mathrm)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, \Upsilon, \Phi, X, \Psi, \Omega,$ $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, v, \phi, \chi, \psi, \omega, \epsilon, \vartheta, \varpi, \varrho, \varsigma, \varphi,$

Math Bold (\mathbf)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z,a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, \Upsilon, \Phi, X, \Psi, \Omega,$ $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \nu, \phi, \chi, \psi, \omega, \epsilon, \vartheta, \sigma, \varrho, \zeta, \varphi,$

Caligraphic (\mathcal)

 $\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}, \mathcal{E}, \mathcal{F}, \mathcal{G}, \mathcal{H}, \mathcal{I}, \mathcal{J}, \mathcal{K}, \mathcal{L}, \mathcal{M}, \mathcal{N}, \mathcal{O}, \mathcal{P}, \mathcal{Q}, \mathcal{R}, \mathcal{F}, \mathcal{T}, \mathcal{U}, \mathcal{V}, \mathcal{W}, \mathcal{X}, \mathcal{Y}, \mathcal{Z}, \mathcal{Z}$

Script (\mathscr)

 $\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}, \mathcal{E}, \mathcal{F}, \mathcal{G}, \mathcal{H}, \mathcal{I}, \mathcal{I}, \mathcal{K}, \mathcal{L}, \mathcal{M}, \mathcal{N}, \mathcal{O}, \mathcal{P}, \mathcal{Q}, \mathcal{R}, \mathcal{F}, \mathcal{T}, \mathcal{U}, \mathcal{V}, \mathcal{W}, \mathcal{X}, \mathcal{Y}, \mathcal{Z}, \mathcal{Z}, \mathcal{A}, \mathcal{A}$

Fraktur (\mathfrak)

a, b, c, d, e, f, g, h, i, j, t, l, m, n, o, p, q, r, s, t, u, v, w, r, h, z,

Blackboard Bold (\mathbb)

A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z,

3.2.4 Character Sidebearings Serif Bold

Default

$$|A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + |a| $

Math Roman (\mathrm)

$$\begin{aligned} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |\Gamma| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |\Lambda| + |M| + \\ |N| + |\Xi| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |\Upsilon| + |\Phi| + |X| + |\Psi| + |\Omega| + \end{aligned}$$

Math Bold (\mathbf)

$$\begin{aligned} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |T| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |A| + |M| + \\ |N| + |E| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |\Upsilon| + |\Phi| + |X| + |\Psi| + |\Omega| + \\ \end{aligned}$$

$$\begin{aligned} |\mathcal{A}| + |\mathcal{B}| + |\mathcal{C}| + |\mathcal{D}| + |\mathcal{E}| + |\mathcal{F}| + |\mathcal{G}| + |\mathcal{H}| + |\mathcal{I}| + |\mathcal{I}| + |\mathcal{I}| + |\mathcal{H}| +$$

3.2.5 Superscript Positioning Serif Bold

Default

$$\begin{split} A^2 + B^2 + C^2 + D^2 + E^2 + F^2 + G^2 + H^2 + I^2 + J^2 + K^2 + L^2 + M^2 + \\ N^2 + O^2 + P^2 + Q^2 + R^2 + S^2 + T^2 + U^2 + V^2 + W^2 + X^2 + Y^2 + Z^2 + \\ a^2 + b^2 + c^2 + d^2 + e^2 + f^2 + g^2 + h^2 + i^2 + j^2 + k^2 + l^2 + m^2 + \\ n^2 + o^2 + p^2 + q^2 + r^2 + s^2 + t^2 + u^2 + v^2 + w^2 + x^2 + y^2 + z^2 + \\ A^2 + B^2 + \Gamma^2 + \Delta^2 + E^2 + Z^2 + H^2 + \Theta^2 + I^2 + K^2 + \Lambda^2 + M^2 + \\ N^2 + \Xi^2 + O^2 + \Pi^2 + P^2 + \Sigma^2 + T^2 + \Upsilon^2 + \Phi^2 + X^2 + \Psi^2 + \Omega^2 + \\ \alpha^2 + \beta^2 + \gamma^2 + \delta^2 + \epsilon^2 + \zeta^2 + \eta^2 + \theta^2 + \iota^2 + \kappa^2 + \lambda^2 + \mu^2 + \\ v^2 + \xi^2 + o^2 + \pi^2 + \rho^2 + \sigma^2 + \tau^2 + v^2 + \phi^2 + \chi^2 + \psi^2 + \omega^2 + \\ \varepsilon^2 + \vartheta^2 + \varpi^2 + \varrho^2 + \zeta^2 + \varphi^2 + \end{split}$$

Math Roman (\mathrm)

$$\begin{array}{l} A^2 + B^2 + C^2 + D^2 + E^2 + F^2 + G^2 + H^2 + I^2 + J^2 + K^2 + L^2 + M^2 + \\ N^2 + O^2 + P^2 + Q^2 + R^2 + S^2 + T^2 + U^2 + V^2 + W^2 + X^2 + Y^2 + Z^2 + \\ a^2 + b^2 + c^2 + d^2 + e^2 + f^2 + g^2 + h^2 + i^2 + j^2 + k^2 + I^2 + m^2 + \\ n^2 + o^2 + p^2 + q^2 + r^2 + s^2 + t^2 + u^2 + v^2 + w^2 + x^2 + y^2 + z^2 + \\ A^2 + B^2 + \Gamma^2 + \Delta^2 + E^2 + Z^2 + H^2 + \Theta^2 + I^2 + K^2 + \Lambda^2 + M^2 + \\ N^2 + \Xi^2 + O^2 + \Pi^2 + P^2 + \Sigma^2 + T^2 + \Upsilon^2 + \Phi^2 + X^2 + \Psi^2 + \Omega^2 + C^2 + C$$

Math Bold (\mathbf)

$$A^{2} + B^{2} + C^{2} + D^{2} + E^{2} + F^{2} + G^{2} + H^{2} + I^{2} + J^{2} + K^{2} + L^{2} + M^{2} + N^{2} + O^{2} + P^{2} + Q^{2} + R^{2} + S^{2} + T^{2} + U^{2} + V^{2} + W^{2} + X^{2} + Y^{2} + Z^{2} + a^{2} + b^{2} + c^{2} + d^{2} + e^{2} + f^{2} + g^{2} + h^{2} + i^{2} + j^{2} + k^{2} + l^{2} + m^{2} + n^{2} + o^{2} + p^{2} + q^{2} + r^{2} + s^{2} + t^{2} + u^{2} + v^{2} + x^{2} + y^{2} + z^{2} + A^{2} + B^{2} + \Gamma^{2} + \Delta^{2} + E^{2} + Z^{2} + H^{2} + \Theta^{2} + I^{2} + K^{2} + \Lambda^{2} + M^{2} + N^{2} + \Xi^{2} + O^{2} + \Pi^{2} + P^{2} + \Sigma^{2} + T^{2} + \Upsilon^{2} + \Phi^{2} + X^{2} + \Psi^{2} + \Omega^{2} + \Omega^{2$$

$$\mathcal{A}^{2} + \mathcal{B}^{2} + \mathcal{C}^{2} + \mathcal{D}^{2} + \mathcal{E}^{2} + \mathcal{F}^{2} $

3.2.6 Subscript Positioning Serif Bold

Default

$$\begin{split} A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + \\ N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + \\ a_{i} + b_{i} + c_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + \\ n_{i} + o_{i} + p_{i} + q_{i} + r_{i} + s_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + \\ A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + \\ N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + \Upsilon_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + \\ a_{i} + \beta_{i} + \gamma_{i} + \delta_{i} + \epsilon_{i} + \zeta_{i} + \eta_{i} + \theta_{i} + \iota_{i} + \kappa_{i} + \lambda_{i} + \mu_{i} + \\ v_{i} + \xi_{i} + o_{i} + \pi_{i} + \rho_{i} + \sigma_{i} + \tau_{i} + v_{i} + \phi_{i} + \chi_{i} + \psi_{i} + \omega_{i} + \\ \varepsilon_{i} + \vartheta_{i} + \varpi_{i} + \varrho_{i} + \zeta_{i} + \varphi_{i} + \end{split}$$

Math Roman (\mathrm)

$$\begin{aligned} &A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + \\ &N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + \\ &a_{i} + b_{i} + c_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + I_{i} + m_{i} + \\ &n_{i} + o_{i} + p_{i} + q_{i} + r_{i} + s_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + \\ &A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + \\ &N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + \Upsilon_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + \end{aligned}$$

Math Bold (\mathbf)

$$\begin{aligned} A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + \\ N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + \\ a_{i} + b_{i} + c_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + \\ n_{i} + o_{i} + p_{i} + q_{i} + r_{i} + s_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + \\ A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + \\ N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + \Upsilon_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + \end{aligned}$$

$$\mathcal{A}_i + \mathcal{B}_i + \mathcal{C}_i + \mathcal{D}_i + \mathcal{E}_i + \mathcal{F}_i + \mathcal{G}_i + \mathcal{H}_i + \mathcal{J}_i + \mathcal{J}_i + \mathcal{H}_i + \mathcal{L}_i + \mathcal{M}_i + \mathcal{N}_i + \mathcal{O}_i + \mathcal{P}_i + \mathcal{Q}_i + \mathcal{R}_i + \mathcal{F}_i + \mathcal{T}_i + \mathcal{U}_i + \mathcal{V}_i + \mathcal{W}_i + \mathcal{X}_i + \mathcal{Y}_i + \mathcal{Z}_i + \mathcal{D}_i + \mathcal$$

3.2.7 Accent Positioning Serif Bold

Default

Math Italic (\mathit)

Math Roman (\mathrm)

$$\begin{split} \hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{i} + \hat{j} + \hat{k} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{\Theta} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{T} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} + \end{split}$$

Math Bold (\mathbf)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{i} + \hat{j} + \hat{k} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{\Theta} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{Z} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{\Upsilon} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} +$$

Math Calligraphic (\mathcal)

$$\hat{A} + \hat{B} + \hat{C} + \hat{G} + \hat{C} +$$

3.2.8 Differentials Serif Bold

```
dA + dB + dC + dD + dE + dF + dG + dH + dI + dJ + dK + dL + dM +
dN + dO + dP + dQ + dR + dS + dT + dU + dV + dW + dX + dY + dZ +
da + db + dc + dd + de + df + dg + dh + di + dj + dk + dl + dm +
dn + do + dp + dq + dr + ds + dt + du + dv + dw + dx + dy + dz +
dA + dB + d\Gamma + d\Delta + dE + dZ + dH + d\Theta + dI + dK + d\Lambda + dM +
dN + d\Xi + dO + d\Pi + dP + d\Sigma + dT + d\Upsilon + d\Phi + dX + d\Psi + d\Omega +
d\alpha + d\beta + d\gamma + d\delta + d\epsilon + d\zeta + d\eta + d\theta + d\iota + d\kappa + d\lambda + d\mu +
dv + d\xi + do + d\pi + d\rho + d\sigma + d\tau + dv + d\phi + d\chi + d\psi + d\omega +
d\varepsilon + d\vartheta + d\varpi + d\varrho + d\varsigma + d\varphi +
dA + dB + d\Gamma + d\Delta + dE + dZ + dH + d\Theta + dI + dK + d\Lambda + dM +
dN + d\Xi + dO + d\Pi + dP + d\Sigma + dT + d\Upsilon + d\Phi + dX + d\Psi + d\Omega +
```

 $\partial A + \partial B + \partial C + \partial D + \partial E + \partial F + \partial G + \partial H + \partial I + \partial J + \partial K + \partial L + \partial M + \partial C $\partial N + \partial O + \partial P + \partial Q + \partial R + \partial S + \partial T + \partial U + \partial V + \partial W + \partial X + \partial Y + \partial Z + \partial C $\partial a + \partial b + \partial c + \partial d + \partial e + \partial f + \partial g + \partial h + \partial i + \partial j + \partial k + \partial l + \partial m + \partial c + \partial c + \partial d + \partial c + \partial d + \partial c + \partial d $\partial n + \partial o + \partial p + \partial q + \partial r + \partial s + \partial t + \partial u + \partial v + \partial w + \partial x + \partial y + \partial z $\partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \partial A $\partial N + \partial \Xi + \partial O + \partial \Pi + \partial P + \partial \Sigma + \partial T + \partial \Upsilon + \partial \Phi + \partial X + \partial \Psi + \partial \Omega + \partial \Psi $\partial \alpha + \partial \beta + \partial \gamma + \partial \delta + \partial \epsilon + \partial \zeta + \partial \eta + \partial \theta + \partial \iota + \partial \kappa + \partial \lambda + \partial \mu +$ $\partial v + \partial \xi + \partial o + \partial \pi + \partial \rho + \partial \sigma + \partial \tau + \partial v + \partial \phi + \partial \chi + \partial \psi + \partial \omega +$ $\partial \varepsilon + \partial \vartheta + \partial \varpi + \partial \rho + \partial \zeta + \partial \varphi +$ $\partial A + \partial B + \partial \Gamma + \partial \Delta + \partial E + \partial Z + \partial H + \partial \Theta + \partial I + \partial K + \partial \Lambda + \partial M + \partial A $\partial N + \partial \Xi + \partial O + \partial \Pi + \partial P + \partial \Sigma + \partial T + \partial \Upsilon + \partial \Phi + \partial X + \partial \Psi + \partial \Omega +$

3.2.9 Slash Kerning Serif Bold

1/A + 1/B + 1/C + 1/D + 1/E + 1/F + 1/G + 1/H + 1/I + 1/J + 1/K + 1/L + 1/M + 1/H /N + 1/O + 1/P + 1/Q + 1/R + 1/S + 1/T + 1/U + 1/V + 1/W + 1/X + 1/Y + 1/Z /a + 1/b + 1/c + 1/d + 1/e + 1/f + 1/g + 1/h + 1/i + 1/j + 1/k + 1/l + 1/m + 1/l /n + 1/o + 1/p + 1/q + 1/r + 1/s + 1/t + 1/u + 1/v + 1/w + 1/x + 1/y + 1/z + $1/A + 1/B + 1/\Gamma + 1/\Delta + 1/E + 1/Z + 1/H + 1/\Theta + 1/I + 1/K + 1/\Lambda + 1/M $1/N + 1/\Xi + 1/O + 1/\Pi + 1/P + 1/\Sigma + 1/T + 1/\Upsilon + 1/\Phi + 1/X + 1/\Psi + 1/\Omega +$ $1/\alpha + 1/\beta + 1/\gamma + 1/\delta + 1/\epsilon + 1/\zeta + 1/\eta + 1/\theta + 1/\iota + 1/\kappa + 1/\lambda + 1/\mu +$ $1/\nu + 1/\xi + 1/o + 1/\pi + 1/\rho + 1/\sigma + 1/\tau + 1/\upsilon + 1/\phi + 1/\chi + 1/\psi + 1/\omega + 1/\omega$ $1/\varepsilon + 1/\vartheta + 1/\varpi + 1/\varrho + 1/\varsigma + 1/\varphi +$

$$A/2 + B/2 + C/2 + D/2 + E/2 + F/2 + G/2 + H/2 + I/2 + J/2 + K/2 + L/2 + M/2 + N/2 + O/2 + P/2 + Q/2 + R/2 + S/2 + T/2 + U/2 + V/2 + W/2 + X/2 + Y/2 + Z/2 + a/2 + b/2 + c/2 + d/2 + e/2 + f/2 + g/2 + h/2 + i/2 + j/2 + k/2 + l/2 + m/2 + n/2 + o/2 + p/2 + q/2 + r/2 + s/2 + t/2 + u/2 + v/2 + w/2 + x/2 + y/2 + z/2 + A/2 + B/2 + \Gamma/2 + \Delta/2 + E/2 + Z/2 + H/2 + \Theta/2 + I/2 + K/2 + \Lambda/2 + M/2 + N/2 + E/2 + O/2 + \Pi/2 + P/2 + E/2 + T/2 + T/2 + \Phi/2 + X/2 + \Psi/2 + \Omega/2 + a/2 + \beta/2 + \gamma/2 + \delta/2 + e/2 + \zeta/2 + \eta/2 + \theta/2 + v/2 + \lambda/2 + \mu/2 + v/2 + \xi/2 + o/2 + \pi/2 + \rho/2 + \sigma/2 + \tau/2 + v/2 + \phi/2 + \chi/2 + \psi/2 + \omega/2 + \varepsilon/2 + \vartheta/2 + \varpi/2 + \rho/2 + c/2 + \varphi/2 + \psi/2 + \omega/2 + \varepsilon/2 + \vartheta/2 + \varpi/2 + \rho/2 + c/2 + \varphi/2 + \psi/2 + \omega/2 + \omega/2 + \psi/2 + \omega/2 $

3.2.10 Big Operators Serif Bold

$$\sum_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n} \int_{i=1}^{n} x^{n} \oint_{i=1}^{n} x^{n}$$

$$\bigotimes_{i=1}^{n} x^{n} \bigoplus_{i=1}^{n} x^{n} \bigcap_{i=1}^{n} x^{n} \bigvee_{i=1}^{n} x^{n} \bigcup_{i=1}^{n} x^{n} \bigcup_{i=1}^{n} x^{n} \bigcap_{i=1}^{n} x^{n} \bigcup_{i=1}^{n} x^{n}$$

3.2.11 Radicals Serif Bold

$$\sqrt{x+y} \qquad \sqrt{x^2+y^2} \qquad \sqrt{x_i^2+y_j^2} \qquad \sqrt{\left(\frac{\cos x}{2}\right)} \qquad \sqrt{\left(\frac{\sin x}{2}\right)}$$

$$\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{x+y}}}}}$$

3.2.12 Over- and Underbraces Serif Bold

$$\widehat{x}$$
 $\widehat{x+y}$ $\widehat{x^2+y^2}$ $\widehat{x_i^2+y_j^2}$ \underbrace{x} $\underbrace{x+y}$ $\underbrace{x_i+y_j}$ $\underbrace{x_i^2+y_j^2}$

3.2.13 Normal and Wide Accents Serif Bold

$$\dot{x}$$
 \ddot{x} \ddot{x}

 \hat{x} \check{x} \tilde{x} \check{x} \dot{x} \dot{x} \dot{x} \dot{x} \dot{x} \dot{x}

3.2.14 Long Arrows Serif Bold



3.2.15 Left and Right Delimiters Serif Bold

$$-(f) - -[f] - -|f| - -|f| - -\langle f \rangle - -\{f\} -$$

Using \left and \right.

$$-\big(f\big)--[f]--|f]--[f]--\langle f\rangle--\{f\}-$$

3.2.16 Big-g-g Delimiters Serif Bold

3.2.17 Binary Operators Serif Bold

$x \pm y$	\pm	$x \cap y$	\cap	$x \diamond y$	\diamond	$x \oplus y$	\oplus
$x \mp y$	\mp	$x \cup y$	\cup	$x \triangle y$	\bigtriangleup	$x \ominus y$	\ominus
$x \times y$	\times	$x \uplus y$	\uplus	$x \nabla y$	\bigtriangledown	$x \otimes y$	\otimes
$x \div y$	\div	$x\sqcap y$	\sqcap	$x \triangleleft y$	\triangleleft	$x \oslash y$	\oslash
x * y	\ast	$x \sqcup y$	\sqcup	$x \triangleright y$	\triangleright	$x \odot y$	\odot
$x \star y$	\star	$x \lor y$	\vee	$x \triangleleft y$	\lhd	$x\bigcirc y$	\bigcirc
$x \circ y$	\circ	$x \wedge y$	\wedge	$x \triangleright y$	\rhd	$x \dagger y$	\dagger
$x \bullet y$	\bullet	$x \setminus y$	\setminus	$x \triangleleft y$	\unlhd	$x \ddagger y$	\ddagger
$x \cdot y$	\cdot	$x \wr y$	\wr	$x \trianglerighteq y$	\unrhd	x§ y	\ S
x + y	+	x-y	-	$x \coprod y$	\amalg	$x^{\P}y$	\ P

3.2.18 Relations Serif Bold

$x \leq y$	\leq	$x \ge y$	\geq	$x \equiv y$	\equiv	$x \models y$	\models
$x \prec y$	\prec	$x \succ y$	\succ	$x \sim y$	\sim	$x \perp y$	\perp
$x \leq y$	\preceq	$x \succeq y$	\succeq	$x \simeq y$	\simeq	$x \mid y$	\mid
$x \ll y$	\11	$x \gg y$	\gg	$x \simeq y$	\asymp	$x \parallel y$	\parallel
$x \subset y$	\subset	$x \supset y$	\supset	$x \approx y$	\approx	$x \bowtie y$	\bowtie
$x \subseteq y$	\subseteq	$x \supseteq y$	\supseteq	$x \cong y$	\cong	$x \bowtie y$	\Join
$x \sqsubset y$	\sqsubset	$x \supset y$	\sqsupset	$x \neq y$	\neq	$x \smile y$	\smile
$x \sqsubseteq y$	\sqsubseteq	$x \supseteq y$	\sqsupseteq	$x \doteq y$	\doteq	x - y	\frown
$x \in y$	\in	$x \ni y$	\ni	$x \propto y$	\propto	x = y	=
$x \vdash y$	\vdash	$x \dashv y$	\dashv	x < y	<	x > y	>
x:y	•						

3.2.19 Punctuation Serif Bold

```
x,y , x;y ; x:y \colon x.y \ldotp x\cdot y \cdotp
```

3.2.20 Arrows Serif Bold

$x \leftarrow y$	\leftarrow	$x \leftarrow y$	\longleftarrow	$x \uparrow y$	\uparrow
$x \Leftarrow y$	\Leftarrow	$x \leftarrow y$	\Longleftarrow	$x \uparrow y$	\Uparrow
$x \rightarrow y$	\rightarrow	$x \longrightarrow y$	\longrightarrow	$x \downarrow y$	\downarrow
$x \Rightarrow y$	\Rightarrow	$x \Longrightarrow y$	\Longrightarrow	$x \downarrow y$	\Downarrow
$x \longleftrightarrow y$	\leftrightarrow	$x \longleftrightarrow y$	\longleftrightarrow	$x \uparrow y$	\updownarrow
$x \Leftrightarrow y$	\Leftrightarrow	$x \Longleftrightarrow y$	\Longleftrightarrow	$x \updownarrow y$	\Updownarrow
$x \mapsto y$	\mapsto	$x \longmapsto y$	\longmapsto	$x \nearrow y$	\nearrow
$x \leftarrow y$	\hookleftarrow	$x \hookrightarrow y$	\hookrightarrow	$x \setminus y$	\searrow
$x \leftarrow y$	\leftharpoonup	$x \rightarrow y$	\rightharpoonup	$x \not y$	\swarrow
$x \leftarrow y$	\leftharpoondown	$x \rightarrow y$	\rightharpoondown	$x \setminus y$	\nwarrow
$x \rightleftharpoons v$	\rightleftharpoons	$x \leadsto v$	\leadsto		

3.2.21 Miscellaneous Symbols Serif Bold

```
x:y
         \ldots
                               \cdots
                                                        \vdots
                                                                          x \cdot y
                                                                                    \ddots
x...y
                     x \cdots y
хХу
         \aleph
                               \prime
                                                x \forall y
                                                       \forall
                                                                                    \infty
                     x/y
                                                                          x \infty y
хħу
         \hbar
                     x \emptyset y
                               \emptyset
                                               x\exists y
                                                       \exists
                                                                                    \Box
                                                                          x\Box y
         \imath
                     x\nabla y
                               \nabla
                                                        \neg
                                                                          x \Diamond y
                                                                                    \Diamond
xıy
                                                x \neg y
         \jmath
                               \surd
                                               xby
                                                        \flat
                                                                          x\Delta y
                                                                                    \triangle
хју
                     x\sqrt{y}
         \ell
                     xTy
                                                        \natural
                                                                          x - y
                                                                                    \clubsuit
x\ell y
                               \top
                                                x \nmid y
                     x \perp y
                               \bot
                                                                          x \diamondsuit y
                                                                                    \diamondsuit
         \wp
                                                x \sharp y
                                                        \sharp
x \rho y
x\Re y
         \Re
                     x||y|
                               \backslash |
                                                x \setminus y
                                                        \backslash
                                                                          x \nabla y
                                                                                    \heartsuit
x\Im y
         \Im
                     x \angle y
                               \angle
                                               x\partial y
                                                       \partial
                                                                          x \spadesuit y
                                                                                    \spadesuit
                                                        1
х
         \mho
                     x.y
                                                x|y
                                                                          x!y
                                                                                    !
```

3.2.22 **Variable-Sized Operators Serif Bold**

```
x \sum y
        \sum
                     x \cap y
                             \bigcap
                                            x \bigcirc y
                                                      \bigodot
x \prod y
        \prod
                     x[]y
                             \bigcup
                                            x \otimes y
                                                      \bigotimes
x \prod y
        \coprod
                     x \mid y
                             \bigsqcup
                                            x \oplus y
                                                      \bigoplus
x \int y
         \int
                     x \setminus y
                             \bigvee
                                            x+y
                                                      \biguplus
x \phi y
         \oint
                     x \wedge y
                             \bigwedge
```

3.2.23 Log-Like Operators Serif Bold

```
x arccos y
             x \cos y
                         x \csc y
                                    x \exp y
                                               xkery
                                                             x \lim \sup y
                                                                           x min y
                                                                                      x sinh y
x arcsin y
             x \cosh y
                         x \deg y
                                   x \gcd y
                                               x \log y
                                                             x \ln y
                                                                           x Pry
                                                                                      x \sup y
x arctan y
             x \cot y
                         x dety
                                    x hom y
                                               x \lim y
                                                             x \log y
                                                                           x \sec y
                                                                                      xtany
x argy
             x \coth y
                         x \dim y
                                   x inf y
                                               x \lim \inf y
                                                             x \max y
                                                                           x \sin y
                                                                                      x tanh y
```

3.2.24 **Delimiters Serif Bold**

```
x(y)
                    x)y
                            )
                                         x \uparrow y
                                                   \uparrow
                                                                       x \uparrow y
                                                                                 \Uparrow
      [
                            ]
x[y]
                    x]y
                                         x \downarrow y
                                                   \downarrow
                                                                       x \downarrow y
                                                                                \Downarrow
x\{y
      \{
                    x}y
                            \}
                                         x \uparrow y
                                                   \updownarrow
                                                                       x \updownarrow y
                                                                                \Updownarrow
x|y
       \lfloor
                    x|y
                           \rfloor
                                         x[y]
                                                   \lceil
                                                                       x]y
                                                                                 \rceil
                                                                                 \backslash
x\langle y
       \langle
                    x\rangle y
                            \rangle
                                         x/y
                                                   /
                                                                        x \setminus y
x|y
                    x||y
                           \backslash I
```

3.2.25 Large Delimiters Serif Bold

```
\lgroup
\rmoustache
                  \lmoustache
                                    \rgroup
\arrowvert
                  \Arrowvert
                                    \bracevert
```

3.2.26 Math Mode Accents Serif Bold

```
\hat{a} \hat{a} \dot{a} \acute{a} \bar{a} \bar{a} \dot{a} \dot{a} \ddot{a} \breve{a} \ddot{a} \check{a} \dot{a} \grave{a} \ddot{a} \vec{a} \ddot{a} \dot{a} \ddot{a} \tilde{a}
```

3.2.27 Miscellaneous Constructions Serif Bold

```
abc
       \widetilde{abc}
                             abc
                                    \widehat{abc}
àbc
       \overleftarrow{abc}
                            abc
                                    \overrightarrow{abc}
abc
      \overline{abc}
                                    \underline{abc}
                             abc
abc
      \overbrace{abc}
                                    \underbrace{abc}
                             abc
                             √abc
√abc
      \sqrt{abc}
                                    \sqrt[n]{abc}
f'
       f'
                                    \frac{abc}{xyz}
                             xyz
```

3.2.28 AMS Delimiters Serif Bold

```
x^Ty \ullcorner x^Ty \urlcorner x \perp y \llcorner x \perp y \llcorner
```

3.2.29 AMS Arrows Serif Bold

```
x \longrightarrow y \setminus dashrightarrow
                                            x \leftarrow -y \setminus dashleftarrow
           \leftleftarrows
x = y
                                                        \leftrightarrows
                                            x \leftrightarrows y
x \in y
           \Lleftarrow
                                            x \leftarrow y
                                                        \twoheadleftarrow
           \leftarrowtail
                                                        \looparrowleft
x \leftarrow y
                                            x \notin y
           \leftrightharpoons
                                                       \curvearrowleft
x = y
                                            x \cap y
x \circlearrowleft y
           \circlearrowleft
                                            x \uparrow y
                                                        \Lsh
           \upuparrows
                                                        \upharpoonleft
x \uparrow \uparrow y
                                            x \mid y
x \downarrow y
           \downharpoonleft
                                            x \rightarrow y
                                                        \multimap
x \leftrightarrow y
           \leftrightsquigarrow
                                            x \rightrightarrows y
                                                        \rightrightarrows
x \rightleftharpoons y
           \rightleftarrows
                                                        \rightrightarrows
                                            x \rightrightarrows y
x \rightleftharpoons y
           \rightleftarrows
                                            x \rightarrow y
                                                        \twoheadrightarrow
x \mapsto y
           \rightarrowtail
                                                        \looparrowright
                                            x \rightarrow y
x \rightleftharpoons y
           \rightleftharpoons
                                                        \curvearrowright
                                            x \cap y
x \circlearrowleft y
           \circlearrowright
                                            x \upharpoonright y
                                                        \Rsh
x \downarrow \downarrow y
           \downdownarrows
                                            x \mid y
                                                        \upharpoonright
x \mid y
           \downharpoonright
                                                        \rightsquigarrow
                                            x \leadsto y
```

3.2.30 AMS Negated Arrows Serif Bold

```
x \nleftrightarrow y \nleftarrow x \nleftrightarrow y \nrightarrow x \nleftrightarrow y \nRightarrow x \nleftrightarrow y \nleftrightarrow x \nleftrightarrow y \nLeftrightarrow
```

3.2.31 AMS Greek Serif Bold

 $x \neq y$ \digamma $x \neq y$ \varkappa

3.2.32 AMS Hebrew Serif Bold

 $x \exists y$ \beth $x \exists y$ \daleth $x \exists y$ \gimel

3.2.33 AMS Miscellaneous Serif Bold

хħу	\hbar	хћу	\hslash
$x \triangle y$	\vartriangle	$x \nabla y$	\triangledown
$x\Box y$	\square	$x \Diamond y$	\lozenge
xSy	\circledS	x∠y	\angle
<i>x</i> ∡ <i>y</i>	\measuredangle	x∄y	\nexists
x $\mho y$	\mho	$x \exists y$	\Finv ^u
x $\ni y$	\Game^u	xk y	\Bbbk ^u
<i>x</i> \ <i>y</i>	\backprime	xØy	\varnothing
$x \blacktriangle y$	\blacktriangle	$x \nabla y$	\blacktriangledown
<i>x</i> ■ <i>y</i>	\blacksquare	<i>x</i> ♦ <i>y</i>	\blacklozenge
$x \star y$	\bigstar	<i>x</i> ∢ <i>y</i>	\sphericalangle
xl y	\complement	хðу	\eth
x/y	\diagup^u	$x \setminus y$	\diagdown ^u
11 NT - 4 .	1 - C' 1 '	1	-C'

u Not defined in amssymb.sty, define using the \newsymbol command.

3.2.34 AMS Binary Operators Serif Bold

$x \dotplus y$	\dotplus	$x \setminus y$	\smallsetminus
$x \cap y$	\Cap	$x \uplus y$	\Cup
$x \overline{\wedge} y$	\barwedge	$x \vee y$	\veebar
$x \overline{\wedge} y$	\doublebarwedge	$x \boxminus y$	\boxminus
$x \boxtimes y$	\boxtimes	$x \boxdot y$	\boxdot
$x \boxplus y$	\boxplus	x * y	\divideontimes
$x \ltimes y$	\ltimes	$x \rtimes y$	\rtimes
$x \setminus y$	\leftthreetimes	$x \wedge y$	\rightthreetimes
$x \curlywedge y$	\curlywedge	$x \Upsilon y$	\curlyvee
$x \ominus y$	\circleddash	$x \otimes y$	\circledast
$x \odot y$	\circledcirc	$x \cdot y$	\centerdot
$x \intercal y$	\intercal		

 $x \leq y$

3.2.35 AMS Relations Serif Bold

 $x \lesssim y$ \lesssim $x \cong y$ \approxeq $x \ll y \setminus 111$ $x \leq y$ \lesseqgtr $x \doteqdot y$ \doteqdot x = y\fallingdotseq \backsimeq x = y $x \subseteq y$ \Subset $x \preccurlyeq y$ \preccurlyeq $x \preceq y$ \precsim $x \triangleleft y$ \vartriangleleft $x \models y$ \vDash $x \smile y$ \smallsmile x = y\bumpeq $x \ge y$ \geqq

\leqslant

 $x \gg y \setminus ggg$

 $x \geqslant y$

 $x \gtrsim y$

 $x \ge y$ \gtreqless

\eqslantgtr

\gtrapprox

- x = y \eqcirc
- $x \triangleq y$ \triangleq
- $x \approx y$ \thickapprox
- $x \ni y$ \Supset
- $x \succcurlyeq y$ \succcurlyeq
- $x \succeq y$ \succesim
- $x \triangleright y$ \vartriangleright
- $x \Vdash y \quad \forall dash$
- $x \parallel y$ \shortparallel
- $x \pitchfork y$ \pitchfork
- $x \triangleleft y$ \blacktriangleleft
- $x \ni y$ \backepsilon
- x : y \because

3.2.36 AMS Negated Relations Serif Bold

$x \not< y$	\nless	$x \not\leq y$	\nleq
$x \not \leq y$	\nleqslant	$x \not \leq y$	\nleqq
$x \leq y$	\lneq	$x \nleq y$	\lneqq
$x \leq y$	\lvertneqq	$x \nleq y$	\lnsim
$x \lessapprox y$	\lnapprox	$x \not\prec y$	\nprec
$x \not \leq y$	\npreceq	$x \not \supset y$	\precnsim
$x \npreceq y$	\precnapprox	$x \not\sim y$	\nsim
xiy	\nshortmid	$x \nmid y$	\nmid
$x \not\vdash y$	\nvdash	$x \not\models y$	\nvDash
$x \not \Delta y$	\ntriangleleft	$x \not \triangleq y$	\ntrianglelefteq
$x \not\subseteq y$	\nsubseteq	$x \subsetneq y$	\subsetneq
$x \not\subseteq y$	\varsubsetneq	$x \not\subseteq y$	\subsetneqq
$x \not\subseteq y$	\varsubsetneqq	$x \not\geq y$	\ngtr
$x \not\geq y$	\ngeq	$x \not \geq y$	\ngeqslant
$x \not \supseteq y$	\ngeqq	$x \geqslant y$	\gneq
$x \ngeq y$	\gneqq	$x \geqq y$	\gvertneqq
$x \gtrsim y$	\gnsim	$x \geq y$	\gnapprox
$x \not\succ y$	\nsucc	$x \not\succeq y$	\nsucceq
$x \not \sqsubseteq y$	\nsucceqq	$x \not\succsim y$	\succnsim
$x \not\succeq y$	\succnapprox	$x \not\cong y$	\ncong
x y	\nshortparallel	$x \not\parallel y$	\nparallel
$x \not\vDash y$	\nvDash	$x \not\Vdash y$	\nVDash
$x \not\triangleright y$	\ntriangleright	$x \not\trianglerighteq y$	\ntrianglerighteq
$x \not\supseteq y$	\nsupseteq	$x \not\supseteq y$	\nsupseteqq
$x \supsetneq y$	\supsetneq	$x \not\supseteq y$	\varsupsetneq
$x \not\supseteq y$	\supsetneqq	$x \not\supseteq y$	\varsupsetneqq

3.3 Math Test Sans Serif

3.3.1 Overview Sans Serif

Default: ααbβGΓΡΠΣσ mathnormal: ααbβGΓΡΠΣσmathrm: $a\alpha\alpha b\beta G\Gamma P\Pi\Sigma\sigma$ mathup: $a\alpha\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathit: ααbβGΓΡΠΣσ mathbf: ααbβGΓΡΠΣσ mathbfit: **ααbβGΓΡΠΣσ** mathbfup: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$

Default: ααbβGΓΡΠΣσ

mathnormal: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathrm: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathup: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathit: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbf: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbfit: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbfit: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathbfup: $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$

Default: ααbβGΓΡΠΣσ mathnormal: ααbβGΓΡΠΣσ mathrm: ααbβGΓΡΠΣσ mathup: ααbβGΓΡΠΣσ mathit: ααbβGΓΡΠΣσ mathbf: ααbβGΓΡΠΣσ mathbf: ααbβGΓΡΠΣσ mathbfit: ααbβGΓΡΠΣσ mathbfit: ααbβGΓΡΠΣσ mathbfit: ααbβGΓΡΠΣσ

3.3.2 Formulas Sans Serif

 α , β , γ , δ , ε , ζ , η , θ , ι , κ , λ , μ , ν , ξ , o, π , ρ , σ , ς , τ , υ , ϕ , χ , ψ , ω , ε , A, B, Γ , Δ , E, Z, H, Θ , I, K, Λ , M, N, Ξ , O, Π , P, Σ , T, Y, Φ , X, Ψ , Ω , F,

 α , β , γ , δ , ε , ζ , η , θ , ι , κ , λ , μ , ν , ξ , o, π , ρ , σ , ς , τ , υ , ϕ , χ , ψ , ω , ε , A, B, Γ , Δ , E, Z, H, Θ , I, K, Λ , M, N, Ξ , O, Π , P, Σ , T, Y, Φ , X, Ψ , Ω , F,

 α , β , γ , δ , ε , ζ , η , θ , ι , κ , λ , μ , ν , ξ , o, π , ρ , σ , ς , τ , υ , ϕ , χ , ψ , ω , ε , A, B, Γ , Δ , E, Z, H, Θ , I, K, Λ , M, N, Ξ , O, Π , P, Σ , T, Y, Φ , X, Ψ , Ω , ε ,

 α , β , γ , δ , ϵ , ζ , η , θ , ι , κ , λ , μ , ν , ξ , σ , π , ρ , σ , ζ , τ , υ , ϕ , χ , ψ , ω , ϵ , A, B, Γ , Δ , E, Z, H, Θ , I, K, Λ , M, N, Ξ , O, Π , P, Σ , T, Y, Φ , X, Ψ , Ω , F,

$$\alpha a > 0, \beta b + (3 \times 27), \Gamma G = 7 < 8, \lambda$$

 $\alpha a > 0, \beta b + (3 \times 27), \Gamma G = 7 < 8, \lambda$
 $s \pm 3\gamma + y - 1 = 4 \times 7$
 $\hat{\beta} = (X'X)^{-1}X'y$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

$$s \pm 3\gamma + y - 1 \times 7$$

$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

$$s \pm 3\gamma + y - 1 \times 7$$
$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

$$s \pm 3\gamma + y - 1 \times 7$$
$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

3.3.3 Math Alphabets Sans Serif

Default

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z,

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z,

 $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, Y, \Phi, X, \Psi, \Omega$

 $\alpha, \beta, \gamma, \delta, \varepsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \upsilon, \phi, \chi, \psi, \omega, \varepsilon, \vartheta, \omega, \rho, \varsigma, \varphi,$

Math Normal(\mathnormal)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z,

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z,

 $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, Y, \Phi, X, \Psi, \Omega$

 $\alpha, \beta, \gamma, \delta, \varepsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \upsilon, \phi, \chi, \psi, \omega, \varepsilon, \vartheta, \omega, \rho, \varsigma, \varphi,$

Math Italic (\mathit)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z,

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z,

A, B, Γ, Δ, E, Z, H, Θ, I, K, Λ, Μ, N, Ξ, Ο, Π, P, Σ, T, Y, Φ, X, Ψ, Ω,

α, β, γ, δ, ε, ζ, η, θ, ι, κ, λ, μ, ν, ξ, ο, π, ρ, σ, τ, υ, φ, χ, ψ, ω, ε, θ, ω, ρ, ς, φ,

Math Roman (\mathrm)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, A, B, Γ, Δ, E, Z, H, Θ, I, K, Λ, M, N, Ξ, Ο, Π, P, Σ, T, Υ, Φ, X, Ψ, Ω, $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \upsilon, \phi, \chi, \psi, \omega, \epsilon, \vartheta, \varpi, \rho, \varsigma, \varphi,$

Math Bold (\mathbf)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9,

A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z,

a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z,

A, B, Γ, Δ, E, Z, H, Θ, I, K, Λ, M, N, Ξ, Ο, Π, P, Σ, T, Y, Φ, X, Ψ, Ω,

α, β, γ, δ, ε, ζ, η, θ, ι, κ, λ, μ, ν, ξ, ο, π, ρ, σ, τ, υ, φ, χ, ψ, ω, ε, θ, ω, ρ, ς, φ,

Caligraphic (\mathcal)

 $\mathscr{A}, \mathscr{B}, \mathscr{C}, \mathfrak{D}, \mathscr{E}, \mathscr{F}, \mathscr{G}, \mathscr{H}, \mathscr{I}, \mathscr{J}, \mathscr{K}, \mathscr{L}, \mathscr{M}, \mathscr{N}, \mathscr{O}, \mathscr{P}, \mathscr{Q}, \mathscr{R}, \mathscr{S}, \mathscr{T}, \mathscr{U}, \mathscr{V}, \mathscr{W}, \mathscr{X}, \mathscr{Y}, \mathscr{Z}, \mathscr{Y}, \mathscr{Z}, \mathscr{Y}, \mathscr{Y}$

Script (\mathscr)

 $\mathscr{A}, \mathscr{B}, \mathscr{C}, \mathfrak{D}, \mathscr{E}, \mathscr{F}, \mathscr{G}, \mathscr{H}, \mathscr{I}, \mathscr{J}, \mathscr{K}, \mathscr{L}, \mathscr{M}, \mathscr{N}, \mathscr{O}, \mathscr{P}, \mathscr{Q}, \mathscr{R}, \mathscr{S}, \mathscr{T}, \mathscr{U}, \mathscr{V}, \mathscr{W}, \mathscr{X}, \mathscr{Y}, \mathscr{Z}, \mathscr{Y}, \mathscr{Z}, \mathscr{Y}, \mathscr{Z}, \mathscr{Y}, \mathscr{Y}$

Fraktur(\mathfrak)

Blackboard Bold (\mathbb)

A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z,

3.3.4 Character Sidebearings Sans Serif

Default

$$\begin{aligned} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |T| + |A| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |A| + |M| + \\ |N| + |E| + |O| + |\Pi| + |P| + |E| + |T| + |Y| + |\Phi| + |X| + |\Psi| + |\Omega| + \\ |a| + |\beta| + |y| + |\delta| + |E| + |\zeta| + |\eta| + |\theta| + |I| + |k| + |\lambda| + |\mu| + \\ |v| + |S| + |o| + |\pi| + |\rho| + |\sigma| + |\tau| + |v| + |\phi| + |\chi| + |\psi| + |\omega| + \\ |E| + |\vartheta| + |\omega| + |\wp| + |\varsigma| + |\varsigma| + |\varphi| + \end{aligned}$$

Math Roman (\mathrm)

$$\begin{aligned} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |\Gamma| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |\Lambda| + |M| + \\ |N| + |\Xi| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |\Upsilon| + |\Phi| + |X| + |\Psi| + |\Omega| + \\ \end{aligned}$$

Math Bold (\mathbf)

$$\begin{aligned} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |l| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |F| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |\Lambda| + |M| + \\ |N| + |\Xi| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |Y| + |\Phi| + |X| + |\Psi| + |\Omega| + \end{aligned}$$

$$\begin{aligned} |\mathcal{A}| + |\mathcal{B}| + |\mathcal{C}| + |\mathcal{D}| + |\mathcal{E}| + |\mathcal{F}| + |\mathcal{G}| + |\mathcal{H}| + |\mathcal{I}| + |\mathcal{I}| + |\mathcal{H}| +$$

3.3.5 Superscript Positioning Sans Serif

Default

$$A^{2} + B^{2} + C^{2} + D^{2} + E^{2} + F^{2} + G^{2} + H^{2} + I^{2} + J^{2} + K^{2} + L^{2} + M^{2} + N^{2} + O^{2} + P^{2} + Q^{2} + R^{2} + S^{2} + T^{2} + U^{2} + V^{2} + W^{2} + X^{2} + Y^{2} + Z^{2} + D^{2} + D^{2$$

Math Roman (\mathrm)

$$A^{2} + B^{2} + C^{2} + D^{2} + E^{2} + F^{2} + G^{2} + H^{2} + I^{2} + J^{2} + K^{2} + L^{2} + M^{2} + N^{2} + O^{2} + P^{2} + Q^{2} + R^{2} + S^{2} + T^{2} + U^{2} + V^{2} + W^{2} + X^{2} + Y^{2} + Z^{2} + A^{2} + D^{2} + C^{2} + D^{2} + C^{2} + D^{2} + D^{2$$

Math Bold (\mathbf)

$$A^{2} + B^{2} + C^{2} + D^{2} + E^{2} + F^{2} + G^{2} + H^{2} + I^{2} + J^{2} + K^{2} + L^{2} + M^{2} + N^{2} + O^{2} + P^{2} + Q^{2} + R^{2} + S^{2} + T^{2} + U^{2} + V^{2} + W^{2} + X^{2} + Y^{2} + Z^{2} + O^{2} + D^{2} + C^{2} + D^{2} + D^{2$$

$$\mathcal{A}^{2} + \mathcal{B}^{2} + \mathcal{C}^{2} + \mathcal{D}^{2} + \mathcal{E}^{2} + \mathcal{F}^{2} + \mathcal{G}^{2} + \mathcal{H}^{2} + \mathcal{I}^{2} + \mathcal{I}^{2} + \mathcal{H}^{2} $

3.3.6 Subscript Positioning Sans Serif

Default

$$A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + A_{i} + B_{i} + C_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + A_{i} + O_{i} + P_{i} + q_{i} + r_{i} + S_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + Z_{i} + A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + W_{i} + A_{i} + A_{$$

Math Roman (\mathrm)

$$\begin{aligned} &A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + \\ &N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + \\ &a_{i} + b_{i} + c_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + \\ &n_{i} + o_{i} + p_{i} + q_{i} + r_{i} + s_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + \\ &A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + \\ &N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + \Upsilon_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + \end{aligned}$$

Math Bold (\mathbf)

$$A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + A_{i} + B_{i} + C_{i} + A_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + I_{i} + H_{i} + I_{i} + H_{i} + H_{i$$

$$\mathcal{A}_i + \mathcal{B}_i + \mathcal{C}_i + \mathcal{D}_i + \mathcal{E}_i + \mathcal{F}_i + \mathcal{G}_i + \mathcal{H}_i + \mathcal{J}_i + \mathcal{J}_i + \mathcal{H}_i + \mathcal{L}_i + \mathcal{M}_i + \mathcal{N}_i + \mathcal{O}_i + \mathcal{P}_i + \mathcal{Q}_i + \mathcal{R}_i + \mathcal{F}_i + \mathcal{T}_i + \mathcal{U}_i + \mathcal{V}_i + \mathcal{W}_i + \mathcal{X}_i + \mathcal{Y}_i + \mathcal{Z}_i + \mathcal{D}_i + \mathcal$$

3.3.7 Accent Positioning Sans Serif

Default

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{I} + \hat{J} + \hat{k} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{O} + \hat{P} + \hat{Q} + \hat{I} + \hat{S} + \hat{I} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{A} + \hat{E} + \hat{Z} + \hat{H} + \hat{O} + \hat{I} + \hat{K} + \hat{A} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{Z} + \hat{T} + \hat{Y} + \hat{O} + \hat{X} + \hat{W} + \hat{O} + \\ \hat{a} + \hat{B} + \hat{Y} + \hat{S} + \hat{E} + \hat{\zeta} + \hat{\eta} + \hat{\theta} + \hat{I} + \hat{K} + \hat{A} + \hat{\mu} + \\ \hat{V} + \hat{\xi} + \hat{O} + \hat{\pi} + \hat{P} + \hat{O} + \hat{T} + \hat{U} + \hat{V} + \hat{V} + \hat{W} + \hat{W} + \\ \hat{E} + \hat{S} + \hat{O} + \hat{P} + \hat{C} + \hat{C} + \hat{C} + \hat{C} + \hat{C} + \\ \hat{C} + \\ \hat{C} + \hat{C} + \hat{C} + \hat{C} + \hat{C} + \\ \hat{C} + \hat{C} + \hat{C} + \hat{C} + \hat{C} + \\ \hat{C} + \hat{C} + \hat{C} + \hat{C} + \\ \hat{C} + \hat{C} + \hat{C} + \hat{C} + \\ \hat{C} + \hat{C} + \hat{C} + \hat{C} + \\ \hat{C} + \\ \hat{C} + \hat{C} + \\ $

Math Italic (\mathit)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{I} + \hat{J} + \hat{k} + \hat{I} + \hat{m} + \hat{\ell} + \hat{\wp} + \hat{I} + \hat{I} + \hat{I} \\ \hat{n} + \hat{O} + \hat{P} + \hat{Q} + \hat{I} + \hat{S} + \hat{I} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{O} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{Y} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} + \\ \hat{\alpha} + \hat{\beta} + \hat{Y} + \hat{\delta} + \hat{E} + \hat{\zeta} + \hat{\eta} + \hat{O} + \hat{I} + \hat{K} + \hat{\lambda} + \hat{\mu} + \\ \hat{V} + \hat{\xi} + \hat{O} + \hat{\pi} + \hat{P} + \hat{O} + \hat{T} + \hat{U} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\omega} + \\ \hat{E} + \hat{9} + \hat{\omega} + \hat{\rho} + \hat{\varsigma} + \hat{\varsigma} + \hat{\varphi} +$$

Math Roman (\mathrm)

Math Bold (\mathbf)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{I} + \hat{J} + \hat{k} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{O} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{Y} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} +$$

Math Calligraphic (\mathcal)

$$\hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{J} + \hat{J} + \hat{H} +$$

3.3.8 Differentials Sans Serif

$$\partial A + \partial B + \partial C + \partial D + \partial E + \partial F + \partial G + \partial H + \partial I + \partial J + \partial K + \partial L + \partial M + \partial N + \partial O + \partial P + \partial Q + \partial R + \partial S + \partial T + \partial U + \partial V + \partial W + \partial X + \partial Y + \partial Z + \partial A + \partial B + \partial C + \partial A + \partial B + \partial C + \partial A + \partial B + \partial C $

3.3.9 Slash Kerning Sans Serif

```
 1/A + 1/B + 1/C + 1/D + 1/E + 1/F + 1/G + 1/H + 1/I + 1/J + 1/K + 1/L + 1/M + 1/N + 1/O + 1/P + 1/Q + 1/R + 1/S + 1/T + 1/U + 1/V + 1/W + 1/X + 1/Y + 1/Z + 1/a + 1/b + 1/c + 1/d + 1/e + 1/f + 1/g + 1/h + 1/i + 1/j + 1/k + 1/l + 1/m + 1/n + 1/o + 1/p + 1/q + 1/r + 1/s + 1/t + 1/u + 1/v + 1/w + 1/x + 1/y + 1/z + 1/A + 1/B + 1/\Gamma + 1/\Delta + 1/E + 1/Z + 1/H + 1/O + 1/I + 1/K + 1/\Lambda + 1/M + 1/N + 1/\Xi + 1/O + 1/\Pi + 1/P + 1/\Sigma + 1/T + 1/Y + 1/O + 1/X + 1/\Psi + 1/O + 1/A + 1/B + 1/Y + 1/\delta + 1/\epsilon + 1/\zeta + 1/\eta + 1/\theta + 1/\iota + 1/\kappa + 1/\lambda + 1/\mu + 1/\iota ```

$$A/2 + B/2 + C/2 + D/2 + E/2 + F/2 + G/2 + H/2 + I/2 + J/2 + K/2 + L/2 + M/2 + N/2 + O/2 + P/2 + Q/2 + R/2 + S/2 + T/2 + U/2 + V/2 + W/2 + X/2 + Y/2 + Z/2 + a/2 + b/2 + c/2 + d/2 + e/2 + f/2 + g/2 + h/2 + i/2 + j/2 + k/2 + l/2 + m/2 + n/2 + o/2 + p/2 + q/2 + r/2 + s/2 + t/2 + u/2 + v/2 + w/2 + x/2 + y/2 + z/2 + A/2 + B/2 + \Gamma/2 + \Delta/2 + E/2 + Z/2 + H/2 + \Theta/2 + I/2 + K/2 + \Lambda/2 + M/2 + N/2 + E/2 + O/2 + D/2 + E/2 + Z/2 + T/2 + Y/2 + \Phi/2 + \$$

### 3.3.10 Big Operators Sans Serif

$$\sum_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n} \int_{i=1}^{n} x^{n} \oint_{i=1}^{n} x^{n}$$

$$\bigotimes_{i=1}^{n} x^{n} \bigoplus_{i=1}^{n} x^{n} \bigwedge_{i=1}^{n} x^{n} \bigvee_{i=1}^{n} x^{n} \bigoplus_{i=1}^{n} x^{n} \bigcup_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n}$$

### 3.3.11 Radicals Sans Serif

$$\sqrt{x+y} \qquad \sqrt{x^2+y^2} \qquad \sqrt{x_i^2+y_j^2} \qquad \sqrt{\left(\frac{\cos x}{2}\right)} \qquad \sqrt{\left(\frac{\sin x}{2}\right)}$$

$$\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{x+y}}}}}}}$$

### 3.3.12 Over- and Underbraces Sans Serif

$$\widehat{x}$$
  $\widehat{x+y}$   $\widehat{x^2+y^2}$   $\widehat{x_i^2+y_j^2}$   $\underbrace{x}$   $\underbrace{x+y}$   $\underbrace{x_i+y_j}$   $\underbrace{x_i^2+y_j^2}$ 

#### 3.3.13 Normal and Wide Accents Sans Serif

$$\dot{x} \quad \ddot{x} \quad \overline{x} \quad \overline{x} \quad \overline{x} \quad \overline{x} \quad \tilde{x} \quad \hat{x} \quad$$

$$\hat{x}$$
  $\check{x}$   $\check{x}$   $\check{x}$   $\dot{x}$   $\dot{x}$   $\dot{x}$   $\dot{x}$   $\dot{x}$   $\dot{x}$ 

### 3.3.14 Long Arrows Sans Serif



### 3.3.15 Left and Right Delimiters Sans Serif

$$-(f) - -[f] - -|f| - -|f| - -\langle f \rangle - -\{f\}$$

Using \left and \right.

$$-(f) - -[f] - -|f| - -|f| - -\langle f \rangle - -\{f\} -$$

### 3.3.16 Big-g-g Delimiters Sans Serif

#### 3.3.17 **Binary Operators Sans Serif**

```
x \cap y \setminus \text{cap}
 x \diamond y
 \diamond
 \oplus
x \pm y
 \pm
 x \oplus y
 \bigtriangleup
x \mp y
 \mp
 x \cup y
 \cup
 x \ominus y
 \ominus
 X \triangle V
 \times
 x ⊎ y \uplus
 \bigtriangledown
 x \otimes y
 \otimes
x \times y
 x \nabla y
 \triangleleft
 \oslash
x \div y
 \div
 x \sqcap y \setminus sqcap
 x⊲y
 X \oslash y
 \ast
 x \sqcup y \setminus sqcup
 \triangleright
 \odot
X * V
 X \triangleright V
 X \odot V
 \star
 x \lor y \setminus vee
 x ⊲ y \lhd
 X \bigcirc y
 \bigcirc
x \star y
 \circ
 \wedge
 x † y
 \dagger
x \circ y
 x \wedge y
 \setminus
 \bullet
 x \setminus y
 x \triangleleft y \setminus \text{unlhd}
 x ‡ y
 \ddagger
X \bullet y
 \cdot
 \wr
 x \trianglerighteq y \setminus unrhd
 х§у
 \S
x \cdot y
 x≀y
 x \coprod y \setminus amalg
 x \mathbb{P} y
 \P
x + y +
 x - y
```

#### 3.3.18 Relations Sans Serif

```
\models
x \leq y
 \leq
 x \ge y
 \geq
 x \equiv y
 \equiv
 x \models y
x < y
 \prec
 \succ
 \sim
 x \perp y
 \perp
 x > y
 x \sim y
x \leq y
 \preceq
 x \geq y
 \succeq
 x \simeq y
 \simeq
 x \mid y
 \mid
 \parallel
x \ll y
 \11
 x \times y
 \asymp
 x \parallel y
 x \gg y
 \gg
 \bowtie
X \subset Y
 \subset
 \supset
 \approx x \bowtie y
 x\supset y
 x \approx y
 \subseteq
 x \cong y
 \cong
 \Join
X \subseteq Y
 x \supseteq y
 \supseteq
 X \bowtie y
 \sqsubset
 x \neq y
 \neq
 \smile
x \sqsubset y
 x \supset y
 \sqsupset
 x \smile y
 x \frown y \setminus frown
x \sqsubseteq y
 \sqsubseteq
 \sqsupseteq
 x \doteq y
 \doteq
 x \supseteq y
x \in y
 \in
 x \ni y
 \ni
 \propto
 x \propto y
 x = y
 \vdash
 X \dashv V
 \dashv
 x < y
 <
 >
X \vdash y
 x > y
x:y
```

#### 3.3.19 Punctuation Sans Serif

```
x:y \setminus colon x.y \setminus ldotp x\cdot y \setminus cdotp
x, y ,
 X; y;
```

### 3.3.20 Arrows Sans Serif

```
\leftarrow
x \leftarrow v
 x \leftarrow v
 \longleftarrow
 x \uparrow y
 \uparrow
x \leftarrow y
 \Leftarrow
 x \Longleftrightarrow y
 \Longleftarrow
 x \uparrow y
 \Uparrow
x \rightarrow y
 \rightarrow
 x \longrightarrow y
 \longrightarrow
 x \downarrow y
 \downarrow
 \Rightarrow
 \Longrightarrow
 \Downarrow
x \Rightarrow y
 x \Longrightarrow y
 x \parallel y
 \updownarrow
 \leftrightarrow
 \longleftrightarrow
 x \uparrow y
x \leftrightarrow y
 x \longleftrightarrow y
 \Leftrightarrow
 \Longleftrightarrow
x \Leftrightarrow y
 x \Longleftrightarrow y
 \Updownarrow
 \mapsto
 \longmapsto
x \mapsto y
 x \longmapsto y
 x / y
 \nearrow
x \leftarrow y
 \hookleftarrow
 x \hookrightarrow y
 \hookrightarrow
 х 📐 у
 \searrow
 \leftharpoonup
 \rightharpoonup
x \leftarrow y
 x \rightharpoonup y
 x / y
 \swarrow
 \rightharpoondown
 \leftharpoondown
 \nwarrow
x \leftarrow y
 X \rightarrow y
 \rightleftharpoons
 \leadsto
x \rightleftharpoons y
 x ₩ y
```

### 3.3.21 Miscellaneous Symbols Sans Serif

```
x \cdot \cdot \cdot y
x . . . y
 \ldots
 x \cdots y
 \cdots
 x:y
 \vdots
 \ddots
xXy
 \aleph
 \prime
 x \forall y
 \forall
 \infty
 x/y
 x∞y
хћу
 \hbar
 хØу
 \emptyset
 χ∃у
 \exists
 \Box
 x\Box y
 \imath
 x\nabla y
XIY
 \nabla
 x \neg y
 \neg
 x \Diamond y
 \Diamond
 \jmath
 x\sqrt{y}
 \surd
 xby
 \flat
 \triangle
хју
 X\triangle y
xℓy
 \ell
 x \top y
 \top
 хЦу
 \natural
 х♣у
 \clubsuit
 \wp
 x \perp y
 \bot
 x \sharp y
 \sharp
 \diamondsuit
хюу
 x◊y
 x||y|
 \backslash \bot
 \heartsuit
xRey
 \Re
 x \setminus y
 \backslash
 x♡y
xImy
 \Im
 x∠y
 \angle
 хду
 \partial
 х♠у
 \spadesuit
х℧у
 \mho
 !
 x.y
 x|y
 x!y
```

### 3.3.22 Variable-Sized Operators Sans Serif

```
x \sum y
 \sum
 x \cap y \setminus bigcap
 x \odot y
 \bigodot
x \prod y
 \prod
 x \bigcup y
 \bigcup
 x \otimes y
 \bigotimes
x \coprod y
 \coprod
 x \mid y
 \bigsqcup
 x \bigoplus y
 \bigoplus
x ∫ y
 \int
 x \setminus / y
 x + y
 \biguplus
 \bigvee
x \phi y
 \oint
 x \wedge y
 \bigwedge
```

### 3.3.23 Log-Like Operators Sans Serif

```
x arccos y
 x cos y
 x csc y
 x exp y
 x ker y
 x lim sup y
 x min y
 x sinh y
x arcsin y
 x cosh y
 x deg y
 x Pr y
 x gcd y
 x lg y
 x \ln y
 x sup y
x arctan y
 x cot y
 x det y
 x hom y
 x lim y
 x log y
 x tan y
 x sec y
x arg y
 x coth y
 x \dim y \quad x \inf y
 x lim inf y
 x max y
 x sin y
 x tanh y
```

### 3.3.24 Delimiters Sans Serif

```
x(y
 (
 \uparrow
 x)y
 x \uparrow y
 x \uparrow y
 \Uparrow
]
x[y]
 x \downarrow y
 x]y
 \downarrow
 x \downarrow y
 \Downarrow
x{y
 \{
 x}y
 \}
 \updownarrow
 x \updownarrow y
 \Updownarrow
x|y
 \lfloor
 \rfloor
 хГy
 \lceil
 \rceil
 x|y
 x] y
x\langle y
 \langle
 \rangle
 \backslash
 x\rangle y
 x/y
 /
 x \setminus y
x|y
 x||y
 \backslash |
```

### 3.3.25 Large Delimiters Sans Serif

#### 3.3.26 Math Mode Accents Sans Serif

```
â \hat{a}
 ă \breve{a}
\check{a} \check{a} \grave{a} \grave{a} \vec{a} \vec{a} \ddot{a} \ddot{a} \tilde{a} \tilde{a}
```

### 3.3.27 Miscellaneous Constructions Sans Serif

```
abc
 \widetilde{abc}
 abc
 \widehat{abc}
abc
 abc
 \overleftarrow{abc}
 \overrightarrow{abc}
abc
 \overline{abc}
 abc
 \underline{abc}
abc`
 \overbrace{abc}
 abc
 \underbrace{abc}
√abc
 ∜abc
 \sqrt{abc}
 \sqrt[n]{abc}
 f'
 <u>abc</u>
 \frac{abc}{xyz}
```

### 3.3.28 AMS Delimiters Sans Serif

```
x^ry \ulcorner x[¬]y \urcorner x_∟y \llcorner x_⊥y \lrcorner
```

### 3.3.29 AMS Arrows Sans Serif

```
x ←-- y \dashleftarrow
x \longrightarrow y \setminus dashrightarrow
 \leftleftarrows
x \not\sqsubseteq y
 x \leftrightarrows y
 \leftrightarrows
x \Leftarrow y
 \Lleftarrow
 \twoheadleftarrow
 \leftarrowtail
 \looparrowleft
x \leftarrow y
 x \notin y
 \curvearrowleft
x \leftrightharpoons y
 \leftrightharpoons
 X \cap y
хОу
 \circlearrowleft
 x \uparrow y
 \Lsh
x ↑↑ y
 \upuparrows
 \upharpoonleft
 x \mid y
 \downharpoonleft
x \downarrow y
 x \rightarrow y
 \multimap
 \rightrightarrows
 \leftrightsquigarrow x \Rightarrow y
x ↔ > y
x \rightleftharpoons y
 \rightleftarrows
 x \rightrightarrows y
 \rightrightarrows
x \rightleftarrows y
 \rightleftarrows
 x \rightarrow y
 \twoheadrightarrow
 \rightarrowtail
x \rightarrow v
 х 🕆 у
 \looparrowright
 \rightleftharpoons
 \curvearrowright
x \rightleftharpoons y
 X \cap Y
хОу
 \circlearrowright
 x
ightharpoonup y
 \Rsh
x \downarrow \downarrow y
 \downdownarrows
 \upharpoonright
 x | y
x \mid y
 \downharpoonright
 \rightsquigarrow
 x ⊶ y
```

### 3.3.30 AMS Negated Arrows Sans Serif

```
x ← y
 \nleftarrow
 \nrightarrow
 x \rightarrow y
x \not\leftarrow y
 \nLeftarrow
 \nRightarrow
 x \Rightarrow y
x \leftrightarrow y \nleftrightarrow x \Leftrightarrow y \nLeftrightarrow
```

### 3.3.31 AMS Greek Sans Serif

xfy \digamma xxy \varkappa

### 3.3.32 AMS Hebrew Sans Serif

### 3.3.33 AMS Miscellaneous Sans Serif

| хћу                  | \hbar                | хћу             | \hslash                          |
|----------------------|----------------------|-----------------|----------------------------------|
| $x \triangle y$      | \vartriangle         | $x \nabla y$    | \triangledown                    |
| $x\Box y$            | \square              | $x\Diamond y$   | \lozenge                         |
| хSу                  | \circledS            | x∠y             | \angle                           |
| x∡y                  | \measuredangle       | х∄у             | \nexists                         |
| х℧у                  | \mho                 | х Ју            | \Finv <sup>u</sup>               |
| хӘу                  | $\Game^u$            | x k y           | \Bbbk <sup>u</sup>               |
| <i>x</i> \ <i>y</i>  | \backprime           | хØу             | \varnothing                      |
| $x \blacktriangle y$ | \blacktriangle       | $x \nabla y$    | \blacktriangledown               |
| x <b>■</b> y         | \blacksquare         | x∳y             | \blacklozenge                    |
| x★y                  | \bigstar             | x∢y             | \sphericalangle                  |
| хСу                  | \complement          | хðу             | \eth                             |
| x/y                  | $\diagup^u$          | $x \setminus y$ | \diagdown <sup>u</sup>           |
| u Not d              | efined in amssymb, s | tv def          | ine using the \newsymbol command |

<sup>&</sup>lt;sup>u</sup> Not defined in amssymb.sty, define using the \newsymbol command.

## 3.3.34 AMS Binary Operators Sans Serif

| $x \dotplus y$             | \dotplus        | $x \setminus y$            | \smallsetminus   |
|----------------------------|-----------------|----------------------------|------------------|
| $x \cap y$                 | <b>\Cap</b>     | $x \cup y$                 | \Cup             |
| $x \overline{\wedge} y$    | \barwedge       | $x \stackrel{\vee}{=} y$   | \veebar          |
| $x \overline{\wedge} y$    | \doublebarwedge | $x \boxminus y$            | \boxminus        |
| $x \boxtimes y$            | \boxtimes       | $x \odot y$                | \boxdot          |
| $x \boxplus y$             | \boxplus        | <i>x</i>                   | \divideontimes   |
| $x \ltimes y$              | \ltimes         | $x \rtimes y$              | \rtimes          |
| $x \searrow y$             | \leftthreetimes | $x \rightthreetimes y$     | \rightthreetimes |
| $x \downarrow y$           | \curlywedge     | $x \Upsilon y$             | \curlyvee        |
| $x \ominus y$              | \circleddash    | $x \circledast y$          | \circledast      |
| $x \odot y$                | \circledcirc    | <i>x</i> <b>.</b> <i>y</i> | \centerdot       |
| <i>x</i> <b>T</b> <i>y</i> | \intercal       |                            |                  |

### 3.3.35 AMS Relations Sans Serif

- $x \leq y$ \leqslant
- $x \lesssim y$ \lesssim
- $x \approx y$ \approxeq
- $x \ll y \setminus 111$
- $x \leq y$  \lesseqgtr
- $x \doteq y \setminus doteqdot$
- x = y\fallingdotseq
- \backsimeq  $x \hookrightarrow y$
- $x \subseteq y$ \Subset
- \preccurlyeq  $x \leq y$
- $x \precsim y$ \precsim
- $x \triangleleft y$ \vartriangleleft
- $x \models y$ \vDash
- $x \smile y$  \smallsmile
- x = y\bumpeq
- $x \ge y$ \geqq
- $x \geqslant y$ \eqslantgtr
- $x \gtrsim y$ \gtrapprox
- $x \gg y \setminus ggg$
- $x \ge y$  \gtreqless
- x = y\eqcirc
- $x \triangleq y$ \triangleq
- $x \approx y$ \thickapprox
- $x \ni y$ \Supset
- \succcurlyeq  $x \succcurlyeq y$
- $x \gtrsim y$ \succsim
- \vartriangleright  $x \triangleright y$
- **\Vdash**
- \shortparallel  $X \parallel Y$
- $x \pitchfork y$ \pitchfork
- *x* **⋖** *y* \blacktriangleleft
- \backepsilon хэу
- \because *x* ∵ *y*

## 3.3.36 AMS Negated Relations Sans Serif

| $x \not< y$          | \nless          | $x \not \leq y$            | \nleq             |
|----------------------|-----------------|----------------------------|-------------------|
| x ≰ y                | \nleqslant      | x <b>≰</b> y               | \nleqq            |
| $x \leq y$           | \lneq           | $x \nleq y$                | \lneqq            |
| $x \leq y$           | \lvertneqq      | $x \lesssim y$             | \lnsim            |
| x ≨ y                | \lnapprox       | <i>x</i> ⊀ <i>y</i>        | \nprec            |
| $x \not \leq y$      | \npreceq        | <i>x</i> ⋨ <i>y</i>        | \precnsim         |
| x                    | \precnapprox    | <i>x</i> <b>≁</b> <i>y</i> | \nsim             |
| $x \dot{x} y$        | \nshortmid      | $x \nmid y$                | \nmid             |
| $x \not\vdash y$     | \nvdash         | x ⊭ y                      | \nvDash           |
| $x \not \triangle y$ | \ntriangleleft  | <i>x</i> ⊉ <i>y</i>        | \ntrianglelefteq  |
| x ⊈ y                | \nsubseteq      | $x \subsetneq y$           | \subsetneq        |
| $x \not\subseteq y$  | \varsubsetneq   | $x \subsetneq y$           | \subsetneqq       |
| x                    | \varsubsetneqq  | $x \not\geq y$             | \ngtr             |
| $x \not\geq y$       | \ngeq           | $x \not\geq y$             | \ngeqslant        |
| x <b>≱</b> y         | \ngeqq          | $x \geq y$                 | \gneq             |
| $x \ngeq y$          | \gneqq          | $x \geqq y$                | \gvertneqq        |
| $x \gtrsim y$        | \gnsim          | x ≩ y                      | \gnapprox         |
| $x \not\succ y$      | \nsucc          | $x \not\succeq y$          | \nsucceq          |
| $x \not \equiv y$    | \nsucceqq       | $x \succsim y$             | \succnsim         |
| x ‰ y                | \succnapprox    | $x \not\cong y$            | \ncong            |
| хиу                  | \nshortparallel | <i>x</i> ∦ <i>y</i>        | \nparallel        |
| x ⊭ y                | \nvDash         | x                          | \nVDash           |
| <i>x</i> ≯ <i>y</i>  | \ntriangleright | x ≱ y                      | \ntrianglerighteq |
| x ⊉ y                | \nsupseteq      | x <b>⊉</b> y               | \nsupseteqq       |
| $x \supsetneq y$     | \supsetneq      | $x \supseteq y$            | \varsupsetneq     |
| $x \supseteq y$      | \supsetneqq     | $x \not\supseteq y$        | \varsupsetneqq    |
|                      |                 |                            |                   |

## 3.4 Math Test Sans Serif Bold

### 3.4.1 Overview Sans Serif Bold

Default:  $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$  mathnormal:  $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$  mathrm:  $a\alpha \alpha b\beta G\Gamma P\Pi \Sigma \sigma$  mathup:  $a\alpha \alpha b\beta G\Gamma P\Pi \Sigma \sigma$  mathit:  $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$  mathbf:  $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$  mathbfit:  $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$  mathbfit:  $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$  mathbfup:  $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ 

Default: ααbβGΓΡΠΣσ

mathnormal: ααbβGΓΡΠΣσ mathrm:  $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathup: aαbβGΓΡΠΣσ mathit: ααbβGΓΡΠΣσ mathbf: ααbβGΓΡΠΣσ mathbfit: ααbβGΓΡΠΣσ mathbfup: aαbβGΓΡΠΣσ

Default: ααbβGΓΡΠΣσ mathnormal: ααbβGΓΡΠΣσ mathrm:  $a\alpha b\beta G\Gamma P\Pi \Sigma \sigma$ mathup: aαbβGΓΡΠΣσ mathit: ααbβGΓΡΠΣσ mathbf: ααbβGΓΡΠΣσ mathbfit: ααbβGΓΡΠΣσ mathbfup: aαbβGΓΡΠΣσ

### 3.4.2 Formulas Sans Serif Bold

 $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\epsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ ,  $\iota$ ,  $\kappa$ ,  $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\xi$ , o,  $\pi$ ,  $\rho$ ,  $\sigma$ ,  $\varsigma$ ,  $\tau$ ,  $\upsilon$ ,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\epsilon$ , A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M,  $N, \Xi, O, \Pi, P, \Sigma, T, Y, \Phi, X, \Psi, \Omega, F,$ 

 $\alpha,\beta,\gamma,\delta,\epsilon,\zeta,\eta,\theta,\iota,\kappa,\lambda,\mu,\nu,\xi,o,\pi,\rho,\sigma,\varsigma,\tau,\upsilon,\phi,\chi,\psi,\omega,\varsigma,A,B,\Gamma,\Delta,E,Z,H,\Theta,I,K,$  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T, Y,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ , F,

 $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\epsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ ,  $\iota$ ,  $\kappa$ ,  $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\xi$ ,  $\sigma$ ,  $\pi$ ,  $\rho$ ,  $\sigma$ ,  $\varsigma$ ,  $\tau$ ,  $\upsilon$ ,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\epsilon$ , A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M,  $N, \Xi, O, \Pi, P, \Sigma, T, Y, \Phi, X, \Psi, \Omega, F,$ 

 $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\epsilon$ ,  $\zeta$ ,  $\eta$ ,  $\theta$ ,  $\iota$ ,  $\kappa$ ,  $\lambda$ ,  $\mu$ ,  $\nu$ ,  $\xi$ ,  $\sigma$ ,  $\pi$ ,  $\rho$ ,  $\sigma$ ,  $\varsigma$ ,  $\tau$ ,  $\upsilon$ ,  $\phi$ ,  $\chi$ ,  $\psi$ ,  $\omega$ ,  $\epsilon$ , A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M,  $N, \Xi, O, \Pi, P, \Sigma, T, Y, \Phi, X, \Psi, \Omega, F,$ 

$$\alpha a > 0$$
,  $\beta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$ 

$$\alpha a > 0$$
,  $\beta b + (3 \times 27)$ ,  $\Gamma G = 7 < 8$ ,  $\lambda$ 

$$\mathbf{s} \pm 3\gamma + y - \mathbf{1} = \mathbf{4} \times \mathbf{7}$$

$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

$$s \pm 3\gamma + y - 1 \times 7$$

$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

$$s \pm 3\gamma + y - 1 \times 7$$
$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) \, \mathrm{d}x = \left(\frac{27}{2}\right)$$

$$s \pm 3\gamma + y - 1 \times 7$$
$$\hat{\beta} = (X'X)^{-1}X'y$$

$$\sum_{i=0}^{N} x^{i}$$

$$\int_{-\infty}^{\infty} x f(x) dx = \left(\frac{27}{2}\right)$$

### 3.4.3 Math Alphabets Sans Serif Bold

#### Default

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, A, B, Γ, Δ, E, Z, H, Θ, I, K, Λ, M, N, Ξ, Ο, Π, P, Σ, T, Y, Φ, X, Ψ, Ω, α, β, γ, δ, ε, ζ, η, θ, ι, κ, λ, μ, ν, ξ, ο, π, ρ, σ, τ, υ, φ, χ, ψ, ω, ε,  $\vartheta$ ,  $\varpi$ , ρ, ς,  $\varphi$ ,

### Math Normal (\mathnormal)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, A, B, Γ, Δ, E, Z, H, Θ, I, K, Λ, M, N, Ξ, Ο, Π, P, Σ, T, Y, Φ, X, Ψ, Ω, α, β, γ, δ, ε, ζ, η, θ, ι, κ, λ, μ, ν, ξ, ο, π, ρ, σ, τ, υ, φ, χ, ψ, ω, ε,  $\vartheta$ ,  $\varpi$ , ρ, ς,  $\varphi$ ,

### Math Italic (\mathit)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, $A, B, \Gamma, \Delta, E, Z, H, \Theta, I, K, \Lambda, M, N, \Xi, O, \Pi, P, \Sigma, T, Y, \Phi, X, \Psi, \Omega$  $\alpha, \beta, \gamma, \delta, \varepsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \upsilon, \phi, \chi, \psi, \omega, \varepsilon, \vartheta, \varpi, \rho, \varsigma, \varphi,$ 

#### Math Roman (\mathrm)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z, A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T,  $\Upsilon$ ,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ ,  $\alpha, \beta, \gamma, \delta, \epsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \nu, \phi, \chi, \psi, \omega, \epsilon, \vartheta, \varpi, \varrho, \zeta, \varphi,$ 

### Math Bold (\mathbf)

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z,A, B,  $\Gamma$ ,  $\Delta$ , E, Z, H,  $\Theta$ , I, K,  $\Lambda$ , M, N,  $\Xi$ , O,  $\Pi$ , P,  $\Sigma$ , T, Y,  $\Phi$ , X,  $\Psi$ ,  $\Omega$ ,  $\alpha, \beta, \gamma, \delta, \varepsilon, \zeta, \eta, \theta, \iota, \kappa, \lambda, \mu, \nu, \xi, o, \pi, \rho, \sigma, \tau, \upsilon, \phi, \chi, \psi, \omega, \varepsilon, \vartheta, \varpi, \rho, \varsigma, \varphi,$ 

### Caligraphic (\mathcal)

 $\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}, \mathcal{E}, \mathcal{F}, \mathcal{G}, \mathcal{H}, \mathcal{I}, \mathcal{I}, \mathcal{K}, \mathcal{L}, \mathcal{M}, \mathcal{N}, \mathcal{O}, \mathcal{P}, \mathcal{Q}, \mathcal{R}, \mathcal{F}, \mathcal{T}, \mathcal{U}, \mathcal{V}, \mathcal{W}, \mathcal{X}, \mathcal{Y}, \mathcal{Z}, \mathcal{Z}$ 

#### Script (\mathscr)

 $\mathcal{A}, \mathcal{B}, \mathcal{C}, \mathcal{D}, \mathcal{E}, \mathcal{F}, \mathcal{G}, \mathcal{H}, \mathcal{I}, \mathcal{I}, \mathcal{K}, \mathcal{L}, \mathcal{M}, \mathcal{N}, \mathcal{O}, \mathcal{P}, \mathcal{Q}, \mathcal{R}, \mathcal{F}, \mathcal{T}, \mathcal{U}, \mathcal{V}, \mathcal{W}, \mathcal{X}, \mathcal{V}, \mathcal{Z}, \mathcal{Y}, \mathcal{Z}, \mathcal{V}, \mathcal{Z}, \mathcal{Y}, \mathcal{Y}$ 

### Fraktur (\mathfrak)

 $\mathfrak{A}, \mathfrak{B}, \mathfrak{C}, \mathfrak{D}, \mathfrak{E}, \mathfrak{F}, \mathfrak{G}, \mathfrak{H}, \mathfrak{I}, \mathfrak{I}, \mathfrak{K}, \mathfrak{L}, \mathfrak{M}, \mathfrak{N}, \mathfrak{O}, \mathfrak{P}, \mathfrak{Q}, \mathfrak{R}, \mathfrak{S}, \mathfrak{T}, \mathfrak{U}, \mathfrak{V}, \mathfrak{W}, \mathfrak{X}, \mathfrak{Y}, \mathfrak{Z}, \mathfrak{Z}$ a, b, c, d, e, f, g, h, i, j, t, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z,

### Blackboard Bold (\mathbb)

 $\mathbb{A},\mathbb{B},\mathbb{C},\mathbb{D},\mathbb{E},\mathbb{F},\mathbb{G},\mathbb{H},\mathbb{I},\mathbb{J},\mathbb{K},\mathbb{L},\mathbb{M},\mathbb{N},\mathbb{O},\mathbb{P},\mathbb{Q},\mathbb{R},\mathbb{S},\mathbb{T},\mathbb{U},\mathbb{V},\mathbb{W},\mathbb{X},\mathbb{Y},\mathbb{Z},$ 

### 3.4.4 Character Sidebearings Sans Serif Bold

#### Default

$$|A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + |M| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + |A| + |B| + |C| + |A| + |E| + |F| + |G| + |h| + |I| + |J| + |K| + |I| + |M| + |I| $

#### Math Roman (\mathrm)

$$\begin{aligned} |A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + \\ |N| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + \\ |a| + |b| + |c| + |d| + |e| + |f| + |g| + |h| + |i| + |j| + |k| + |I| + |m| + \\ |n| + |o| + |p| + |q| + |r| + |s| + |t| + |u| + |v| + |w| + |x| + |y| + |z| + \\ |A| + |B| + |\Gamma| + |\Delta| + |E| + |Z| + |H| + |\Theta| + |I| + |K| + |A| + |M| + \\ |N| + |\Xi| + |O| + |\Pi| + |P| + |\Sigma| + |T| + |\Upsilon| + |\Phi| + |X| + |\Psi| + |\Omega| + \end{aligned}$$

### Math Bold (\mathbf)

$$|A| + |B| + |C| + |D| + |E| + |F| + |G| + |H| + |I| + |J| + |K| + |L| + |M| + |M| + |O| + |P| + |Q| + |R| + |S| + |T| + |U| + |V| + |W| + |X| + |Y| + |Z| + |A| + |B| + |C| + |A| + |B| + |F| + |B| + |I| $

$$\begin{aligned} |\mathcal{A}| + |\mathcal{B}| + |\mathcal{C}| + |\mathcal{D}| + |\mathcal{E}| + |\mathcal{F}| + |\mathcal{G}| + |\mathcal{H}| + |\mathcal{I}| + |\mathcal{I}| + |\mathcal{H}| +$$

### 3.4.5 Superscript Positioning Sans Serif Bold

Default

$$A^{2} + B^{2} + C^{2} + D^{2} + E^{2} + F^{2} + G^{2} + H^{2} + I^{2} + J^{2} + K^{2} + L^{2} + M^{2} + N^{2} + O^{2} + P^{2} + Q^{2} + R^{2} + S^{2} + T^{2} + U^{2} + V^{2} + W^{2} + X^{2} + Y^{2} + Z^{2} + D^{2} + D^{2$$

#### Math Roman (\mathrm)

$$\begin{array}{l} A^2 + B^2 + C^2 + D^2 + E^2 + F^2 + G^2 + H^2 + I^2 + J^2 + K^2 + L^2 + M^2 + \\ N^2 + O^2 + P^2 + Q^2 + R^2 + S^2 + T^2 + U^2 + V^2 + W^2 + X^2 + Y^2 + Z^2 + \\ a^2 + b^2 + c^2 + d^2 + e^2 + f^2 + g^2 + h^2 + i^2 + j^2 + k^2 + I^2 + m^2 + \\ n^2 + o^2 + p^2 + q^2 + r^2 + s^2 + t^2 + u^2 + v^2 + w^2 + x^2 + y^2 + z^2 + \\ A^2 + B^2 + \Gamma^2 + \Delta^2 + E^2 + Z^2 + H^2 + \Theta^2 + I^2 + K^2 + \Lambda^2 + M^2 + \\ N^2 + \Xi^2 + O^2 + \Pi^2 + P^2 + \Sigma^2 + T^2 + \Upsilon^2 + \Phi^2 + X^2 + \Psi^2 + \Omega^2 + \\ \end{array}$$

### Math Bold (\mathbf)

$$A^{2} + B^{2} + C^{2} + D^{2} + E^{2} + F^{2} + G^{2} + H^{2} + I^{2} + J^{2} + K^{2} + L^{2} + M^{2} + N^{2} + O^{2} + P^{2} + Q^{2} + R^{2} + S^{2} + T^{2} + U^{2} + V^{2} + W^{2} + X^{2} + Y^{2} + Z^{2} + Q^{2} + D^{2} + C^{2} + D^{2} + D^{2$$

$$\mathcal{A}^{2} + \mathcal{B}^{2} + \mathcal{C}^{2} + \mathcal{D}^{2} + \mathcal{E}^{2} + \mathcal{F}^{2} + \mathcal{G}^{2} + \mathcal{H}^{2} + \mathcal{I}^{2} + \mathcal{I}^{2} + \mathcal{H}^{2} + \mathcal{L}^{2} + \mathcal{M}^{2} + \mathcal{N}^{2} + \mathcal{O}^{2} + \mathcal{P}^{2} + \mathcal{Q}^{2} + \mathcal{R}^{2} + \mathcal{P}^{2} + \mathcal{P}^{2} + \mathcal{P}^{2} + \mathcal{V}^{2} + \mathcal{V}^{2} + \mathcal{Y}^{2} $

### 3.4.6 Subscript Positioning Sans Serif Bold

#### Default

$$A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + A_{i} + D_{i} + C_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + N_{i} + O_{i} + P_{i} + q_{i} + r_{i} + S_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + Z_{i} + A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + Y_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + A_{i} + P_{i} + P_{$$

#### Math Roman (\mathrm)

$$\begin{aligned} &A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + \\ &N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + \\ &a_{i} + b_{i} + c_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + \\ &n_{i} + o_{i} + p_{i} + q_{i} + r_{i} + s_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + \\ &A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + \\ &N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + \Upsilon_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + \end{aligned}$$

### Math Bold (\mathbf)

$$A_{i} + B_{i} + C_{i} + D_{i} + E_{i} + F_{i} + G_{i} + H_{i} + I_{i} + J_{i} + K_{i} + L_{i} + M_{i} + N_{i} + O_{i} + P_{i} + Q_{i} + R_{i} + S_{i} + T_{i} + U_{i} + V_{i} + W_{i} + X_{i} + Y_{i} + Z_{i} + A_{i} + D_{i} + C_{i} + d_{i} + e_{i} + f_{i} + g_{i} + h_{i} + i_{i} + j_{i} + k_{i} + l_{i} + m_{i} + N_{i} + O_{i} + P_{i} + q_{i} + r_{i} + S_{i} + t_{i} + u_{i} + v_{i} + w_{i} + x_{i} + y_{i} + z_{i} + A_{i} + B_{i} + \Gamma_{i} + \Delta_{i} + E_{i} + Z_{i} + H_{i} + \Theta_{i} + I_{i} + K_{i} + \Lambda_{i} + M_{i} + N_{i} + \Xi_{i} + O_{i} + \Pi_{i} + P_{i} + \Sigma_{i} + T_{i} + Y_{i} + \Phi_{i} + X_{i} + \Psi_{i} + \Omega_{i} + \Omega_{i$$

$$\mathcal{A}_i + \mathcal{B}_i + \mathcal{C}_i + \mathcal{D}_i + \mathcal{E}_i + \mathcal{F}_i + \mathcal{G}_i + \mathcal{H}_i + \mathcal{J}_i + \mathcal{J}_i + \mathcal{H}_i + \mathcal{L}_i + \mathcal{M}_i + \mathcal{N}_i + \mathcal{O}_i + \mathcal{P}_i + \mathcal{Q}_i + \mathcal{R}_i + \mathcal{F}_i + \mathcal{T}_i + \mathcal{V}_i + \mathcal{V}_i + \mathcal{V}_i + \mathcal{Y}_i + \mathcal{Y}_i + \mathcal{Z}_i + \mathcal$$

### 3.4.7 Accent Positioning Sans Serif Bold

#### Default

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{I} + \hat{J} + \hat{k} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{O} + \hat{P} + \hat{Q} + \hat{F} + \hat{S} + \hat{t} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{O} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{Y} + \hat{O} + \hat{X} + \hat{\Psi} + \hat{\Omega} + \\ \hat{\alpha} + \hat{\beta} + \hat{Y} + \hat{\delta} + \hat{\epsilon} + \hat{\zeta} + \hat{\eta} + \hat{\theta} + \hat{I} + \hat{K} + \hat{\lambda} + \hat{\mu} + \\ \hat{V} + \hat{\xi} + \hat{O} + \hat{\pi} + \hat{P} + \hat{O} + \hat{\tau} + \hat{U} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{O} + \\ \hat{\epsilon} + \hat{\vartheta} + \hat{O} + \hat{P} + \hat{C} + \hat{C} + \hat{C} + \hat{C} + \hat{C} + \\ \hat{\epsilon} + \hat{\vartheta} + \hat{O} + \hat{C} + \hat{C} + \hat{C} + \hat{C} + \\ \hat{C} + \hat{C} + \hat{C} + \hat{C} + \hat{C} + \hat{C} + \\ \hat{C} + \hat{C} + \hat{C} + \hat{C} + \hat{C} + \\ \hat{C} + \hat{C} + \hat{C} + \hat{C} + \\ \hat{C} + \hat{C} + \hat{C} + \hat{C} + \\ \hat{C} + \hat{C} + \hat{C} + \hat{C} + \\ \hat{C} + \\ \hat{C} + \hat{C} + \\ \hat$$

### Math Italic (\mathit)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{I} + \hat{J} + \hat{k} + \hat{I} + \hat{m} + \hat{\ell} + \hat{\wp} + \hat{I} + \hat{J} + \hat{I} \\ \hat{n} + \hat{O} + \hat{P} + \hat{q} + \hat{r} + \hat{S} + \hat{t} + \hat{u} + \hat{V} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{O} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{Y} + \hat{O} + \hat{X} + \hat{\Psi} + \hat{\Omega} + \\ \hat{a} + \hat{\beta} + \hat{\gamma} + \hat{\delta} + \hat{\epsilon} + \hat{\zeta} + \hat{\eta} + \hat{\theta} + \hat{I} + \hat{\kappa} + \hat{\lambda} + \hat{\mu} + \\ \hat{v} + \hat{\xi} + \hat{O} + \hat{\pi} + \hat{P} + \hat{O} + \hat{\tau} + \hat{U} + \hat{\phi} + \hat{\chi} + \hat{\Psi} + \hat{\omega} + \\ \hat{\epsilon} + \hat{\vartheta} + \hat{O} + \hat{\tau} + \hat{\rho} + \hat{\tau} $

#### Math Roman (\mathrm)

$$\begin{split} \hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{1} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{i} + \hat{j} + \hat{k} + \hat{1} + \hat{m} + \\ \hat{n} + \hat{o} + \hat{p} + \hat{q} + \hat{r} + \hat{s} + \hat{t} + \hat{u} + \hat{v} + \hat{w} + \hat{x} + \hat{y} + \hat{z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{\Theta} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{T} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} + \end{split}$$

### Math Bold (\mathbf)

$$\hat{0} + \hat{1} + \hat{2} + \hat{3} + \hat{4} + \hat{5} + \hat{6} + \hat{7} + \hat{8} + \hat{9} + \\ \hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{I} + \hat{J} + \hat{K} + \hat{L} + \hat{M} + \\ \hat{N} + \hat{O} + \hat{P} + \hat{Q} + \hat{R} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{a} + \hat{b} + \hat{c} + \hat{d} + \hat{e} + \hat{f} + \hat{g} + \hat{h} + \hat{I} + \hat{J} + \hat{K} + \hat{I} + \hat{m} + \\ \hat{n} + \hat{O} + \hat{P} + \hat{Q} + \hat{F} + \hat{S} + \hat{T} + \hat{U} + \hat{V} + \hat{W} + \hat{X} + \hat{Y} + \hat{Z} + \\ \hat{A} + \hat{B} + \hat{\Gamma} + \hat{\Delta} + \hat{E} + \hat{Z} + \hat{H} + \hat{O} + \hat{I} + \hat{K} + \hat{\Lambda} + \hat{M} + \\ \hat{N} + \hat{\Xi} + \hat{O} + \hat{\Pi} + \hat{P} + \hat{\Sigma} + \hat{T} + \hat{Y} + \hat{\Phi} + \hat{X} + \hat{\Psi} + \hat{\Omega} +$$

### Math Calligraphic (\mathcal)

$$\hat{A} + \hat{B} + \hat{C} + \hat{D} + \hat{E} + \hat{F} + \hat{G} + \hat{H} + \hat{J} + \hat{J} + \hat{H} +$$

#### 3.4.8 Differentials Sans Serif Bold

```
dA + dB + dC + dD + dE + dF + dG + dH + dI + dJ + dK + dL + dM +
dN + dO + dP + dQ + dR + dS + dT + dU + dV + dW + dX + dY + dZ +
da + db + dc + dd + de + df + dg + dh + di + dj + dk + dl + dm +
dn + do + dp + dq + dr + ds + dt + du + dv + dw + dx + dy + dz +
dA + dB + d\Gamma + d\Delta + dE + dZ + dH + d\Theta + dI + dK + d\Lambda + dM +
dN + d\Xi + dO + d\Pi + dP + d\Sigma + dT + dY + d\Phi + dX + d\Psi + d\Omega +
d\alpha + d\beta + d\gamma + d\delta + d\epsilon + d\zeta + d\eta + d\theta + d\iota + d\kappa + d\lambda + d\mu +
dv + d\xi + do + d\pi + d\rho + d\sigma + d\tau + d\nu + d\phi + d\chi + d\psi + d\omega +
d\varepsilon + d\vartheta + d\varpi + d\rho + d\varsigma + d\varphi +
dA + dB + d\Gamma + d\Delta + dE + dZ + dH + d\Theta + dI + dK + d\Lambda + dM +
dN + d\Xi + dO + d\Pi + dP + d\Sigma + dT + d\Upsilon + d\Phi + dX + d\Psi + d\Omega +
```

$$\partial A + \partial B + \partial C + \partial D + \partial E + \partial F + \partial G + \partial H + \partial I + \partial J + \partial K + \partial L + \partial M + \partial N + \partial O + \partial P + \partial Q + \partial R + \partial S + \partial T + \partial U + \partial V + \partial W + \partial X + \partial Y + \partial Z + \partial A + \partial B + \partial C + \partial A + \partial E + \partial F + \partial A + \partial C $

### 3.4.9 Slash Kerning Sans Serif Bold

```
1/A + 1/B + 1/C + 1/D + 1/E + 1/F + 1/G + 1/H + 1/I + 1/I + 1/K + 1/L + 1/M + 1/H
1/N + 1/O + 1/P + 1/Q + 1/R + 1/S + 1/T + 1/U + 1/V + 1/W + 1/X + 1/Y + 1/Z +
1/a + 1/b + 1/c + 1/d + 1/e + 1/f + 1/g + 1/h + 1/i + 1/j + 1/k + 1/l + 1/m + 1/k + 1/l + 1/m + 1/k + 1/l + 1/m + 1/l
1/n + 1/o + 1/p + 1/q + 1/r + 1/s + 1/t + 1/u + 1/v + 1/w + 1/x + 1/y + 1/z +
1/A + 1/B + 1/\Gamma + 1/\Delta + 1/E + 1/Z + 1/H + 1/\Theta + 1/I + 1/K + 1/\Lambda + 1/M +
1/N + 1/\Xi + 1/O + 1/\Pi + 1/P + 1/\Sigma + 1/T + 1/Y + 1/\Phi + 1/X + 1/\Psi + 1/\Omega +
1/\alpha + 1/\beta + 1/\gamma + 1/\delta + 1/\epsilon + 1/\zeta + 1/\eta + 1/\theta + 1/\iota + 1/\kappa + 1/\lambda + 1/\mu +
1/v + 1/\xi + 1/o + 1/\pi + 1/\rho + 1/\sigma + 1/\tau + 1/\upsilon + 1/\phi + 1/\chi + 1/\psi + 1/\omega +
1/\varepsilon + 1/\vartheta + 1/\varpi + 1/\rho + 1/\varsigma + 1/\varphi +
```

$$A/2 + B/2 + C/2 + D/2 + E/2 + F/2 + G/2 + H/2 + I/2 + J/2 + K/2 + L/2 + M/2 + N/2 + O/2 + P/2 + Q/2 + R/2 + S/2 + T/2 + U/2 + V/2 + W/2 + X/2 + Y/2 + Z/2 + a/2 + b/2 + c/2 + d/2 + e/2 + f/2 + g/2 + h/2 + i/2 + j/2 + k/2 + l/2 + m/2 + n/2 + o/2 + p/2 + q/2 + r/2 + s/2 + t/2 + u/2 + v/2 + w/2 + x/2 + y/2 + z/2 + A/2 + B/2 + \Gamma/2 + \Delta/2 + E/2 + Z/2 + H/2 + \Theta/2 + I/2 + K/2 + \Lambda/2 + M/2 + N/2 + E/2 + O/2 + T/2 + Y/2 + O/2 + X/2 + W/2 + A/2 + W/2 + A/2 + B/2 + V/2 + B/2 + C/2 + C/2 + C/2 + T/2 + V/2 + O/2 + X/2 + W/2 + C/2 + C/2 + C/2 + C/2 + O/2 + C/2 + C/2 + O/2 + C/2$$

### 3.4.10 Big Operators Sans Serif Bold

$$\sum_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n} \prod_{i=1}^{n} x^{n} \int_{i=1}^{n} x^{n} \oint_{i=1}^{n} x^{n}$$

$$\bigotimes_{i=1}^{n} x^{n} \bigoplus_{i=1}^{n} x^{n} \bigcap_{i=1}^{n} x^{n} \bigvee_{i=1}^{n} x^{n} \bigcup_{i=1}^{n} x^{n} \bigcup_{i=1}^{n} x^{n} \bigcap_{i=1}^{n} x^{n} \bigcup_{i=1}^{n} x^{n}$$

#### 3.4.11 Radicals Sans Serif Bold

$$\sqrt{x+y} \qquad \sqrt{x^2+y^2} \qquad \sqrt{x_i^2+y_j^2} \qquad \sqrt{\left(\frac{\cos x}{2}\right)} \qquad \sqrt{\left(\frac{\sin x}{2}\right)}$$

$$\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{x+y}}}}}}$$

### 3.4.12 Over- and Underbraces Sans Serif Bold

$$x + y = x^2 + y^2 = x^2 + y^2 = x + y = x_i + y_j = x^2 + y^2_j$$

#### 3.4.13 Normal and Wide Accents Sans Serif Bold

$$\dot{x} \quad \ddot{x} \quad \bar{x} \quad$$

$$\hat{x}$$
  $\hat{x}$   $\hat{x}$   $\hat{x}$   $\hat{x}$   $\hat{x}$   $\hat{x}$   $\hat{x}$   $\hat{x}$   $\hat{x}$   $\hat{x}$ 

## 3.4.14 Long Arrows Sans Serif Bold

### 3.4.15 Left and Right Delimiters Sans Serif Bold

$$-(f) - -[f] - -|f| - -|f| - -\langle f \rangle - -\{f\}$$

Using \left and \right.

$$-(f)$$
  $-[f]$   $-|f|$   $-\langle f \rangle$   $-\{f\}$ 

$$-)f(--)f[--/f/--\backslash f\backslash --/f\backslash --\backslash f/-$$

### 3.4.16 Big-g-g Delimiters Sans Serif Bold

### 3.4.17 Binary Operators Sans Serif Bold

| $x \pm y$                      | \pm     | $x \cap y$          | \cap      | x                      | \diamond         | $x \oplus y$   | \oplus     |
|--------------------------------|---------|---------------------|-----------|------------------------|------------------|----------------|------------|
| $x \mp y$                      | \mp     | $x \cup y$          | \cup      | $x \triangle y$        | \bigtriangleup   | $x \ominus y$  | \ominus    |
| $\mathbf{x} \times \mathbf{y}$ | \times  | $x \uplus y$        | \uplus    | $x \nabla y$           | \bigtriangledown | $x \otimes y$  | \otimes    |
| $x \div y$                     | \div    | $x \sqcap y$        | \sqcap    | $x \triangleleft y$    | \triangleleft    | $x \oslash y$  | \oslash    |
| <i>x</i> * <i>y</i>            | \ast    | $x \sqcup y$        | \sqcup    | $x \triangleright y$   | \triangleright   | $x \odot y$    | \odot      |
| x ★ y                          | \star   | $x \vee y$          | \vee      | $x \triangleleft y$    | <b>\lhd</b>      | $x \bigcirc y$ | \bigcirc   |
| $x \circ y$                    | \circ   | $x \wedge y$        | \wedge    | $x \triangleright y$   | \rhd             | x † y          | \dagger    |
| $x \bullet y$                  | \bullet | $x \setminus y$     | \setminus | $x \triangleleft y$    | \unlhd           | x ‡ y          | \ddagger   |
| $x \cdot y$                    | \cdot   | x≀y                 | \wr       | $x \trianglerighteq y$ | \unrhd           | х§у            | <b>\</b> S |
| x + y                          | +       | <i>x</i> – <i>y</i> | -         | х∐у                    | \amalg           | $x \P y$       | \P         |
|                                |         |                     |           |                        |                  |                |            |

## 3.4.18 Relations Sans Serif Bold

| $x \leq y$          | \leq        | $x \ge y$       | \geq        | $x \equiv y$  | \equiv  | $x \models y$   | \models   |
|---------------------|-------------|-----------------|-------------|---------------|---------|-----------------|-----------|
| x < y               | \prec       | x > y           | \succ       | $x \sim y$    | \sim    | $x \perp y$     | \perp     |
| $x \leq y$          | \preceq     | $x \geq y$      | \succeq     | $x \simeq y$  | \simeq  | x   y           | \mid      |
| $x \ll y$           | \11         | $x \gg y$       | \gg         | $x \times y$  | \asymp  | $x \parallel y$ | \parallel |
| $x \subset y$       | \subset     | $x\supset y$    | \supset     | $x \approx y$ | \approx | $x \bowtie y$   | \bowtie   |
| $x \subseteq y$     | \subseteq   | $x \supseteq y$ | \supseteq   | $x \cong y$   | \cong   | $x\bowtie y$    | \Join     |
| $x \sqsubset y$     | \sqsubset   | $x \supset y$   | \sqsupset   | $x \neq y$    | \neq    | $x \frown y$    | \smile    |
| $x \sqsubseteq y$   | \sqsubseteq | $x \supseteq y$ | \sqsupseteq | $x \doteq y$  | \doteq  | $x \smile y$    | \frown    |
| $x \in y$           | \in         | $x \ni y$       | \ni         | $x \propto y$ | \propto | x = y           | =         |
| <i>x</i> ⊢ <i>y</i> | \vdash      | $x \dashv y$    | \dashv      | x < y         | <       | x > y           | >         |
| <i>x</i> : <i>y</i> | :           |                 |             |               |         |                 |           |

### 3.4.19 Punctuation Sans Serif Bold

```
x,y , x;y ; x:y \colon x.y \ldotp x\cdot y \cdotp
```

### 3.4.20 Arrows Sans Serif Bold

| $x \leftarrow y$         | \leftarrow         | $x \leftarrow\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!\!$ | \longleftarrow      | $x \uparrow y$   | \uparrow     |
|--------------------------|--------------------|----------------------------------------------------------------------------------------|---------------------|------------------|--------------|
| $x \leftarrow y$         | \Leftarrow         | x <b>⇐=</b> y                                                                          | \Longleftarrow      | $x \uparrow y$   | \Uparrow     |
| $x \rightarrow y$        | \rightarrow        | $x \longrightarrow y$                                                                  | \longrightarrow     | $x \downarrow y$ | \downarrow   |
| $x \Rightarrow y$        | \Rightarrow        | $x \Longrightarrow y$                                                                  | \Longrightarrow     | $x \downarrow y$ | \Downarrow   |
| $x \leftrightarrow y$    | \leftrightarrow    | $x \longleftrightarrow y$                                                              | \longleftrightarrow | x                | \updownarrow |
| $x \Leftrightarrow y$    | \Leftrightarrow    | $x \Longleftrightarrow y$                                                              | \Longleftrightarrow | x                | \Updownarrow |
| $x \mapsto y$            | \mapsto            | $x \mapsto y$                                                                          | \longmapsto         | х∕у              | \nearrow     |
| $x \leftarrow y$         | \hookleftarrow     | $x \hookrightarrow y$                                                                  | \hookrightarrow     | x <b>∑</b> y     | \searrow     |
| x                        | \leftharpoonup     | $x \rightharpoonup y$                                                                  | \rightharpoonup     | x ∠ y            | \swarrow     |
| $x \leftarrow y$         | \leftharpoondown   | $x \rightarrow y$                                                                      | \rightharpoondown   | $x \setminus y$  | \nwarrow     |
| $x \rightleftharpoons y$ | \rightleftharpoons | x ⊶ y                                                                                  | \leadsto            |                  |              |

### 3.4.21 Miscellaneous Symbols Sans Serif Bold

```
x:y
x . . . y
 \ldots
 \cdots
 \vdots
 x \cdot y
 \ddots
 x \cdots y
xXy
 \aleph
 \prime
 х∀у
 \forall
 \infty
 x/y
 x∞y
хћу
 \hbar
 \emptyset
 yΕx
 \exists
 \Box
 хØу
 х□у
 \imath
 х∇у
 \nabla
 x¬y
 \neg
 x◊y
 \Diamond
XIY
 \jmath
 x√y
 \surd
 xby
 \flat
 \triangle
хју
 x∆y
 \ell
 \top
 \natural
 \clubsuit
xℓy
 x \top y
 хЦу
 х♣у
 \bot
 \diamondsuit
 \wp
 х⊥у
 x‡y
 \sharp
 х◊у
хюу
xRey
 \Re
 x||y|
 \backslash I
 x\y
 \backslash
 х♡у
 \heartsuit
xImy
 \Im
 x∠y
 \angle
 х∂у
 \partial
 \spadesuit
 хфу
х℧у
 \mho
 x|y
 ı
 x!y
 !
 x.y
```

### 3.4.22 Variable-Sized Operators Sans Serif Bold

```
x \sum y
 \sum
 x \cap y \bigcap
 x ⊙ y
 \bigodot
хПу
 \prod
 x | Jy \bigcup
 x \otimes y
 \bigotimes
x \prod y
 \coprod
 x | y \bigsqcup
 x \oplus y
 \bigoplus
 x \/ y
x∫y
 \bigvee
 x (+) y
 \biguplus
 \int
x \phi y
 \oint
 x \wedge y \bigwedge
```

### 3.4.23 Log-Like Operators Sans Serif Bold

```
x arccos y
 x cos y
 x csc y
 x exp y
 x ker y
 x lim sup y
 x min y
 x sinh y
x arcsin y
 x cosh y
 x deg y
 x gcd y
 x lg y
 x ln y
 x Pr y
 x sup y
x arctan y
 x cot y
 x det y
 x hom y
 x lim y
 x log y
 x sec y
 x tan y
x arg y
 x coth y
 x dim y
 x inf y
 x lim inf y
 x max y
 x sin y
 x tanh y
```

#### 3.4.24 **Delimiters Sans Serif Bold**

```
x \uparrow y
x(v
 (
 x)y
)
 \uparrow
 x \uparrow y
 \Uparrow
x[y
 x]y
]
 x \downarrow y
 \downarrow
 x \downarrow y
 \Downarrow
x{y
 \{
 x}y
 \}
 \updownarrow
 x Û y
 \Updownarrow
x|y
 \lfloor
 x | y
 \rfloor
 хГу
 \lceil
 \rceil
 х]у
x{y
 \langle
 x}y
 \rangle
 x/y
 /
 x\y
 \backslash
x|y
 x||y
 \|
```

### 3.4.25 Large Delimiters Sans Serif Bold

```
\lgroup
\rmoustache
 \lmoustache
 \rgroup
\arrowvert
 \Arrowvert
 \bracevert
```

#### 3.4.26 Math Mode Accents Sans Serif Bold

```
\hat{a} \hat{a} \hat{a} \acute{a} \bar{a} \bar{a} \hat{a} \dot{a} \bar{a} \breve{a} \hat{a} \check{a} \hat{a} \grave{a} \hat{a} \vec{a} \hat{a} \dot{a} \hat{a} \tilde{a}
```

### 3.4.27 Miscellaneous Constructions Sans Serif Bold

```
abc
 \widetilde{abc}
 abc
 \widehat{abc}
àbc
 abc
 \overleftarrow{abc}
 \overrightarrow{abc}
abc
 \overline{abc}
 \underline{abc}
 abc
 \overbrace{abc}
 \underbrace{abc}
abc
 abc
√abc
 ∜abc
 \sqrt[n]{abc}
 \sqrt{abc}
 <u>abc</u>
xyz
f
 f'
 \frac{abc}{xyz}
```

#### 3.4.28 AMS Delimiters Sans Serif Bold

```
x^Ty \ullcorner x^Ty \ullcorner x \perp y \llcorner x \perp y \llcorner
```

### 3.4.29 AMS Arrows Sans Serif Bold

```
x \longrightarrow y \setminus dashrightarrow
 x ←-- y \dashleftarrow
x = y
 \leftleftarrows
 x \hookrightarrow y
 \leftrightarrows
x \in y
 \Lleftarrow
 \twoheadleftarrow
x \leftarrow y
 \leftarrowtail
 x \leftrightarrow y
 \looparrowleft
 \curvearrowleft
x \leftrightharpoons y
 \leftrightharpoons
 x \cap y
 χἡγ
хÓу
 \circlearrowleft
 \Lsh
x ↑↑ y
 \upuparrows
 x 1 y
 \upharpoonleft
x↓y
 \downharpoonleft
 x \rightarrow y
 \multimap
 \leftrightsquigarrow
 \rightrightarrows
x ↔ y
 x \rightrightarrows y
x \rightleftharpoons y
 \rightleftarrows
 x \rightrightarrows y
 \rightrightarrows
x \rightleftharpoons y
 \rightleftarrows
 \twoheadrightarrow
 x \rightarrow y
x \rightarrow y
 \rightarrowtail
 \looparrowright
 x \Rightarrow y
 \rightleftharpoons
 \curvearrowright
x \rightleftharpoons y
 x \cap y
хОу
 \circlearrowright
 x ⋫y
 \Rsh
x \downarrow \downarrow y
 \downdownarrows
 \upharpoonright
 x \ y
x \mid y
 \downharpoonright
 \rightsquigarrow
 x ⊶ y
```

### 3.4.30 AMS Negated Arrows Sans Serif Bold

```
x \leftrightarrow y \nleftarrow x \nrightarrow y \nrightarrow x \nleftrightarrow y \nRightarrow x \nleftrightarrow y \nleftrightarrow x \nleftrightarrow y \nLeftrightarrow
```

### 3.4.31 AMS Greek Sans Serif Bold

**x<sub>F</sub>y** \digamma **x**x**y** \varkappa

### 3.4.32 AMS Hebrew Sans Serif Bold

 $x \exists y$  \beth  $x \exists y$  \daleth  $x \exists y$  \gimel

### 3.4.33 AMS Miscellaneous Sans Serif Bold

| хћу                 | \hbar          | хћу                 | \hslash                |
|---------------------|----------------|---------------------|------------------------|
| $x \triangle y$     | \vartriangle   | x⊽y                 | \triangledown          |
| <i>x</i> □ <i>y</i> | \square        | х◊у                 | \lozenge               |
| хSу                 | \circledS      | x∠y                 | \angle                 |
| x∡y                 | \measuredangle | х∄у                 | \nexists               |
| <b>x</b> ひy         | \mho           | х∃у                 | \Finv <sup>u</sup>     |
| <b>x</b> ∂ <b>y</b> | $\Game^u$      | хky                 | $\Bbbk^u$              |
| <i>x</i> \ <i>y</i> | \backprime     | x∅y                 | \varnothing            |
| x▲y                 | \blacktriangle | х▼у                 | \blacktriangledown     |
| x <b>≡</b> y        | \blacksquare   | х∳у                 | \blacklozenge          |
| x★y                 | \bigstar       | х∢у                 | \sphericalangle        |
| хСу                 | \complement    | хðу                 | \eth                   |
| x/y                 | $\diagup^u$    | <i>x</i> \ <i>y</i> | \diagdown <sup>u</sup> |
| 11 81 - 4 - 4       | - C 1 !        |                     |                        |

<sup>&</sup>quot;Not defined in amssymb.sty, define using the \newsymbol command.

## 3.4.34 AMS Binary Operators Sans Serif Bold

| x + y                           | \dotplus        | $x \setminus y$          | \smallsetminus   |
|---------------------------------|-----------------|--------------------------|------------------|
| <i>x</i> ∩ <i>y</i>             | \Cap            | $x \cup y$               | \Cup             |
| $x \overline{\wedge} y$         | \barwedge       | $x \stackrel{\vee}{=} y$ | \veebar          |
| $x \stackrel{\equiv}{\wedge} y$ | \doublebarwedge | $x \boxminus y$          | \boxminus        |
| $x \boxtimes y$                 | \boxtimes       | <b>x</b> ⊡ <b>y</b>      | \boxdot          |
| $x \boxplus y$                  | \boxplus        | <i>x</i> * <i>y</i>      | \divideontimes   |
| $x \ltimes y$                   | \ltimes         | $x \times y$             | \rtimes          |
| $x \setminus y$                 | \leftthreetimes | $x \times y$             | \rightthreetimes |
| <b>х</b> 人 <b>у</b>             | \curlywedge     | x  ightharpoonup y       | \curlyvee        |
| $x \ominus y$                   | \circleddash    | <b>x</b>                 | \circledast      |
| <i>x</i> ⊚ <i>y</i>             | \circledcirc    | <i>x</i> . <i>y</i>      | \centerdot       |
| хту                             | \intercal       |                          |                  |

**x** ≤ **y** 

### 3.4.35 AMS Relations Sans Serif Bold

 $x \lesssim y$ \lesssim  $x \approx y$ \approxeq  $x \ll y \setminus 111$ \lesseqgtr x = y\doteqdot \fallingdotseq x = y\backsimeq  $x \sim y$ \Subset  $x \leq y$ \preccurlyeq  $x \lesssim y$ \precsim  $x \triangleleft y$ \vartriangleleft  $x \models y$ \vDash  $\mathbf{x} \smile \mathbf{y}$ \smallsmile

\bumpeq

\eqslantgtr

\gtrapprox

\geqq

\leqslant

 $x \gg y \setminus ggg$ 

x = y

 $x \ge y$ 

 $x \geqslant y$ 

 $x \gtrsim y$ 

- $x \ge y$  \gtreqless
- x = y \eqcirc
- $x \triangleq y$  \triangleq
- $x \approx y$  \thickapprox
- **x** ∋ **y** \Supset
- $x \ge y$  \succcurlyeq
- $x \gtrsim y$  \succsim
- $x \triangleright y$  \vartriangleright
- $x \Vdash y$  \Vdash
- x | y \shortparallel
- x ⋔ y \pitchfork
- x **∢** y \blacktriangleleft
- **x** ∍ **y** \backepsilon
- **x** ∵ **y** \because

# 3.4.36 AMS Negated Relations Sans Serif Bold

| <b>x</b> ≮ <b>y</b>           | \nless          | x ≰ y               | \nleq             |
|-------------------------------|-----------------|---------------------|-------------------|
| x ≰ y                         | \nleqslant      | x ≰ y               | \nleqq            |
| $x \leq y$                    | \lneq           | $x \leq y$          | \lneqq            |
| <b>x</b> ≨ <b>y</b>           | \lvertneqq      | <b>x</b> ⋦ <b>y</b> | \lnsim            |
| x ≨ y                         | \lnapprox       | $x \not\prec y$     | \nprec            |
| x <b>≰</b> y                  | \npreceq        | x ⋨ y               | \precnsim         |
| x ≨ y                         | \precnapprox    | <i>x</i> ≁ <i>y</i> | \nsim             |
| $\mathbf{x} \dot{\mathbf{y}}$ | \nshortmid      | x ∤ y               | \nmid             |
| x                             | \nvdash         | $x \nvDash y$       | \nvDash           |
| x ⋪ y                         | \ntriangleleft  | x ⊉ y               | \ntrianglelefteq  |
| <b>x</b> ⊈ <b>y</b>           | \nsubseteq      | $x \subsetneq y$    | \subsetneq        |
| $x \subsetneq y$              | \varsubsetneq   | $x \subsetneq y$    | \subsetneqq       |
| <b>x</b> ≨ <b>y</b>           | \varsubsetneqq  | x ≯ y               | \ngtr             |
| x ≱ y                         | \ngeq           | x ≱ y               | \ngeqslant        |
| x <b>≱</b> y                  | \ngeqq          | $x \geqslant y$     | \gneq             |
| $x \ngeq y$                   | \gneqq          | $x \geq y$          | \gvertneqq        |
| $x \gtrsim y$                 | \gnsim          | x ≩ y               | \gnapprox         |
| $x \not\succ y$               | \nsucc          | $x \not\succeq y$   | \nsucceq          |
| x <u>≱</u> y                  | \nsucceqq       | x ≿ y               | \succnsim         |
| x                             | \succnapprox    | $x \not\cong y$     | \ncong            |
| <b>х</b> и <b>у</b>           | \nshortparallel | x ∦ y               | \nparallel        |
| x⊭y                           | \nvDash         | x                   | \nVDash           |
| x ⋫ y                         | \ntriangleright | x ≱ y               | \ntrianglerighteq |
| x ⊉ y                         | \nsupseteq      | x <b>⊉</b> y        | \nsupseteqq       |
| $x \supseteq y$               | \supsetneq      | $x \supseteq y$     | \varsupsetneq     |
| $x \supseteq y$               | \supsetneqq     | x <b>⊋</b> y        | \varsupsetneqq    |
|                               |                 |                     |                   |

# Lebenslauf

Geboren am 24. Januar 1995 in Summacumlaudeville, wuchs ich in Neustadt (Nordrhein-Westfalen) sowie in Newcastle (Nova Landia, Neufundland) auf. Im Jahr 2013 erlangte ich am Gymnasium Neustadt die allgemeine Hochschulreife. Im Wintersemester 2013/2014 habe ich zunächst das Studium der Kunstgeschichte an der Rheinischen Friedrich-Wilhelms-Universität Bonn begonnen. Im Sommersemester 2014 nahm ich dann das Studium der Volkswirtschaftslehre auf, das ich im August 2018 mit dem Abschluss Master of Science (M. Sc.) beendete (Gesamtnote: 1,3). Meine Masterarbeit "The Influence of Stress on the Performance of BGSE Graduate Students" wurde von Prof. Dr. Lorem Ipsum betreut. Während des Masterstudiums besuchte ich im Herbst 2016 die Universität Tel Aviv in Israel als Austauschstudent. Im Oktober 2018 habe ich das Promotionsstudium an der Bonn Graduate School of Economics aufgenommen.