

Appendix

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Appendix A: Additional information on the candidate surveys

Table A1: Response rates (in %)

	BW	RLP	ST
Christlich Demokratische Union Deutschlands (CDU)	44	61	43
Sozialdemokratische Partei Deutschlands (SPD)	71	50	44
Freie Demokratische Partei (FDP)	58	47	42
Bündnis 90/Die Grünen	73	64	53
Die Linke	66	48	51
Alternative für Deutschland (AfD)	41	29	22
Freie Wähler	64	54	37
Bündnis C – Christen für Deutschland	78	-	-
Demokratie in Bewegung (DiB)	100	-	-
Deutsche Kommunistische Partei (DKP)	0	-	-
DIE PARTEI	60	38	46
Die Basis	36	-	4
Eine für Alle – Partei	n.a. ^a	-	-
Klimaliste	75	19	25
Menschliche Welt	0	-	-
Ökologisch-Demokratische Partei (ÖDP)	68	47	10
Partei der Humanisten	67	-	100
Partei für Gesundheitsforschung	0	-	0
WIR2020	47	-	50
Piratenpartei Deutschland	75	38	40
Volt Deutschland	61	54	-
Tierschutzpartei	-	0	50
Freie Bürger Mitteldeutschland	-	-	22
Gartenpartei	-	-	8
Liberal-Konservative Reformer	-	-	0
Nationaldemokratische Partei Deutschlands (NPD)	-	-	17
Tierschutz hier!	-	-	n.a. ^a
Tierschutzallianz	-	-	0
Individual candidates	75	50	-

a: no contact information available

Appendix B: Descriptive statistics

Table B1: Descriptive statistics

Variable	Scale	Mean	SD	N
Attacks*	5-point scale from 1 (“never”) to 5 (“very often”)	2.56	1.04	866
Benefits of attacks	5-point scale from 1 (“not at all”) to 5 (“very much”)	2.58	1.06	820
Costs of attacks	5-point scale from 1 (“not at all”) to 5 (“very much”)	3.02	.99	836
Balance benefits-costs**	9-point scale from -4 to +4, obtained by subtracting “costs of attacks” from “benefits of attacks”	-.42	1.62	814
Balance benefits-costs (alternative measure)**	5-point scale from 1 (“only costs”) to 5 (“only benefits”)	3.00	.84	791
Benefits: attacks can damage the image of the political opponent	0 (“not mentioned”), 1 (“mentioned”)	.25	.43	672
Benefits: attacks can put oneself in a favorable light	0 (“not mentioned”), 1 (“mentioned”)	.16	.37	672
Benefits: attacks can emphasize policy and character differences	0 (“not mentioned”), 1 (“mentioned”)	.89	.32	672
Benefits: attacks can attract the media	0 (“not mentioned”), 1 (“mentioned”)	.48	.50	672
Benefits: attacks can mobilize own voters	0 (“not mentioned”), 1 (“mentioned”)	.51	.50	672
Benefits: attacks can persuade undecided voters	0 (“not mentioned”), 1 (“mentioned”)	.61	.49	672
Benefits: other	0 (“not mentioned”), 1 (“mentioned”)	.08	.28	672
Costs: attacks can alienate voters who don't like attacks	0 (“not mentioned”), 1 (“mentioned”)	.64	.48	779
Costs: attacks can put oneself in an unfavorable light	0 (“not mentioned”), 1 (“mentioned”)	.51	.50	779
Costs: attacks can cause counterattacks	0 (“not mentioned”), 1 (“mentioned”)	.37	.48	779
Costs: attacks can cause negative media coverage	0 (“not mentioned”), 1 (“mentioned”)	.33	.47	779
Costs: attacks can mobilize voters of the political opponent	0 (“not mentioned”), 1 (“mentioned”)	.45	.50	779
Costs: other	0 (“not mentioned”), 1 (“mentioned”)	.10	.31	779
Member of parliament	0 (“no”), 1 (“yes”)	.10	.31	977
Running for governing party	0 (“no”), 1 (“yes”)	.32	.47	977
Ideological extremism	6-point scale from 0 (“moderate”) to 5 (“extreme”)	1.91	1.53	813
Closeness of the race	3-point scale from 0 (“not close at all”) to 2 (“very close”)	.56	.70	954
Likelihood of getting elected	5-point scale from 1 (“very unlikely”) to 5 (“very likely”)	2.17	1.38	954
Frequency of media coverage	5-point scale from 1 (“never”) to 5 (“very often”)	2.57	1.02	818
Campaign budget	6-point scale from 1 (“<1,000 €”) to 6 (“50,000+ €”)	2.27	1.38	894

Data has been weighted. * dependent variable, ** mediating variable

Appendix C: Additional analyses

Table C1: Mediation model for candidate attacking behavior (full results)

	Mediator: Balance benefits-costs		Dependent variable: attacks		Effect of independent variable on attacks (H8)					
	b	(S.E.)	b	(S.E.)	Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
R ²	.00		.19							
Member of parliament (H2a)	-.23	(.20)	-.02	(.12)	-.09	(.13)	-.02	(.12)	-.06	(.05)
Balance benefits-costs (H1)	-	-	.28***	(.02)						
Constant	-.37***	(.06)	2.70***	(.04)						
R ²	.03		.22							
Running for governing party (H2b)	-.62***	(.13)	-.36***	(.07)	-.52***	(.08)	-.36***	(.07)	-.17	(.04)
Balance benefits-costs (H1)	-	-	.27***	(.02)						
Constant	-.22***	(.07)	2.79***	(.04)						
R ²	.05		.20							
Extremism (H3)	.23***	(.04)	.07**	(.02)	.14***	(.02)	.07**	(.02)	.06	(.01)
Balance benefits-costs (H1)	-	-	.27***	(.02)						
Constant	-.79***	(.09)	2.57***	(.06)						
R ²	.00		.20							
Closeness of the race (H4)	-.01	(.08)	-.03	(.05)	-.03	(.05)	-.03	(.05)	-.00	(.02)
Balance benefits-costs (H1)	-	-	.28***	(.02)						
Constant	-.39***	(.07)	2.71***	(.04)						
R ²	.00		.20							
Likelihood of getting elected (H5)	.00	(.04)	.01	(.03)	.01	(.03)	.01	(.03)	.00	(.01)
Balance benefits-costs (H1)	-	-	.28***	(.02)						
Constant	-.40***	(.11)	2.68***	(.06)						
R ²	.00		.19							
Media coverage (H6)	.08	(.06)	.02	(.03)	.04	(.04)	.02	(.03)	.02	(.02)
Balance benefits-costs (H1)	-	-	.28***	(.02)						
Constant	-.58***	(.16)	2.67***	(.09)						

	Mediator: Balance		Dependent		Effect of independent variable on attacks (H8)					
	benefits-costs		variable: attacks		Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
	b	(S.E.)	b	(S.E.)						
R ²	.01		.20							
Campaign budget (H7)	-.11**	(.04)	-.06*	(.02)	-.09***	(.03)	-.06*	(.02)	-.03	(.01)
Balance benefits-costs (H1)	-	-	.27***	(.02)						
Constant	-.14	(.11)	2.83***	(.06)						

N=783 (min) to 812 (max) candidates who ran in the 2021 Baden-Württemberg state election, the 2021 Rhineland-Palatinate, or the 2021 Saxony-Anhalt state election. Models estimated using SPSS macro PROCESS, version 3.5.3, model 4 (Hayes 2018 Coefficients for the indirect effect of the dependent variable on attack behavior are bootstrapped unstandardized regression coefficients (in parentheses: standard error) (5000 iterations). Note that PROCESS does not provide a significance test for indirect effects; however, the confidence bounds in the table that do not include 0 were also marked as statistically significant when estimating the models in Stata using the command SEM. Dependent variable in all models is self-reported attack behavior. Significance levels: *** p<.001, ** p<.01, * p<.05

Table C2: Mediation model for candidate attacking behavior (including controls)

	Mediator: Balance benefits-costs		Dependent variable: attacks		Effect of independent variable on attacks (H8)					
	b	(S.E.)	b	(S.E.)	Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
R ²	.03		.21							
Member of parliament (H2a)	-.08	(.21)	.03	(.12)	.01	(.13)	.03	(.12)	-.02	(.06)
Balance benefits-costs (H1)	-	-	.28***	(.02)						
Female (0=no, 1=yes)	-.27*	(.13)	-.17*	(.07)						
Age	-.01*	(.00)	-.00	(.00)						
Running in BW (0=no, 1=yes)	-.25	(.24)	.13	(.14)						
Running in RLP (0=no, 1=yes)	-.24	(.18)	.02	(.10)						
Constituency only (0=no, 1=yes)	.48*	(.23)	.06	(.13)						
Party list only (0=no, 1=yes)	.14	(.19)	.06	(.11)						
Constant	.02	(.26)	2.78***	(.15)						
R ²	.04		.23							
Running for governing party (H2b)	-.53***	(.13)	-.32***	(.08)	-.46***	(.08)	-.32***	(.08)	-.14	(.04)
Balance benefits-costs (H1)	-	-	.26***	(.02)						
Female (0=no, 1=yes)	-.23	(.13)	-.14	(.07)						
Age	-.01*	(.00)	-.00	(.00)						
Running in BW (0=no, 1=yes)	-.32	(.23)	.09	(.14)						
Running in RLP (0=no, 1=yes)	-.23	(.18)	.02	(.10)						
Constituency only (0=no, 1=yes)	.37	(.22)	-.00	(.13)						
Party list only (0=no, 1=yes)	.06	(.18)	.00	(.11)						
Constant	.24	(.26)	2.92***	(.15)						
R ²	.07		.22							
Extremism (H3)	.24***	(.04)	.08***	(.02)	.14***	(.02)	.08**	(.02)	.06	(.01)
Balance benefits-costs (H1)	-	-	.26***	(.02)						
Female (0=no, 1=yes)	-.36**	(.13)	-.19*	(.08)						
Age	-.00	(.00)	-.00	(.00)						
Running in BW (0=no, 1=yes)	-.13	(.23)	.15	(.14)						
Running in RLP (0=no, 1=yes)	-.18	(.17)	.02	(.11)						

	Mediator: Balance		Dependent		Effect of independent variable on attacks (H8)					
	benefits-costs		variable: attacks		Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
	b	(S.E.)	b	(S.E.)						
Constituency only (0=no, 1=yes)	.35	(.22)	.04	(.13)						
Party list only (0=no, 1=yes)	.14	(.18)	.05	(.11)						
Constant	-.67*	(.27)	2.59***	(.16)						
R ²	.03		.21							
Closeness of the race (H4)	.01	(.08)	-.04	(.05)	-.03	(.05)	-.04	(.05)	.00	(.02)
Balance benefits-costs (H1)	-	-	.28***	(.02)						
Female (0=no, 1=yes)	-.31*	(.13)	-.16*	(.07)						
Age	-.01*	(.00)	-.00	(.00)						
Running in BW (0=no, 1=yes)	-.29	(.24)	.15	(.14)						
Running in RLP (0=no, 1=yes)	-.25	(.18)	.03	(.11)						
Constituency only (0=no, 1=yes)	.55*	(.23)	.04	(.13)						
Party list only (0=no, 1=yes)	.18	(.19)	.03	(.11)						
Constant	.02	(.27)	2.81***	(.16)						
R ²	.03		.21							
Likelihood of getting elected (H5)	.03	(.05)	.01	(.03)	.02	(.03)	.01	(.03)	.01	(.01)
Balance benefits-costs (H1)	-	-	.28***	(.02)						
Female (0=no, 1=yes)	-.31*	(.13)	-.16*	(.07)						
Age	-.01*	(.00)	-.00	(.00)						
Running in BW (0=no, 1=yes)	-.31	(.24)	.13	(.14)						
Running in RLP (0=no, 1=yes)	-.25	(.18)	.04	(.11)						
Constituency only (0=no, 1=yes)	.57*	(.23)	.07	(.14)						
Party list only (0=no, 1=yes)	.20	(.19)	.06	(.11)						
Constant	-.03	(.28)	2.75***	(.16)						
R ²	.03		.21							
Media coverage (H6)	.09	(.06)	.02	(.03)	.05	(.04)	.02	(.03)	.02	(.02)
Balance benefits-costs (H1)	-	-	.27***	(.02)						
Female (0=no, 1=yes)	-.27*	(.13)	-.16*	(.07)						
Age	-.01*	(.00)	-.00	(.00)						
Running in BW (0=no, 1=yes)	-.24	(.24)	.15	(.14)						

	Mediator: Balance		Dependent		Effect of independent variable on attacks (H8)					
	benefits-costs		variable: attacks		Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
	b	(S.E.)	b	(S.E.)						
Running in RLP (0=no, 1=yes)	-.25	(.18)	.03	(.11)						
Constituency only (0=no, 1=yes)	.50*	(.23)	.05	(.13)						
Party list only (0=no, 1=yes)	.21	(.19)	.05	(.11)						
Constant	-.25	(.32)	2.73***	(.18)						
R ²	.03		.21							
Campaign budget (H7)	-.11**	(.04)	-.07**	(.03)	-.10***	(.03)	-.07**	(.02)	-.03	(.01)
Balance benefits-costs (H1)	-	-	.27***	(.02)						
Female (0=no, 1=yes)	-.25	(.13)	-.17*	(.07)						
Age	-.01	(.00)	-.00	(.00)						
Running in BW (0=no, 1=yes)	-.15	(.24)	.17	(.14)						
Running in RLP (0=no, 1=yes)	-.19	(.18)	.03	(.10)						
Constituency only (0=no, 1=yes)	.38	(.23)	.00	(.13)						
Party list only (0=no, 1=yes)	.02	(.19)	-.04	(.11)						
Constant	.17	(.27)	2.92***	(.16)						

N=778 (min) to 807 (max) candidates who ran in the 2021 Baden-Württemberg state election, the 2021 Rhineland-Palatinate, or the 2021 Saxony-Anhalt state election. Models estimated using SPSS macro PROCESS, version 3.5.3, model 4 (Hayes 2018). Coefficients for the indirect effect of the dependent variable on attack behavior are bootstrapped unstandardized regression coefficients (in parentheses: standard error) (5000 iterations). Note that PROCESS does not provide a significance test for indirect effects; however, the confidence bounds in the table that do not include 0 were also marked as statistically significant when estimating the models in Stata using the command SEM. Dependent variable in all models is self-reported attack behavior. The reference category for state dummies is ST (Saxony-Anhalt). Significance levels: *** p<.001, ** p<.01, * p<.05

Table C3: Mediation model for candidate attacking behavior (alternative measure for balance of benefits and costs)

	Mediator: Balance benefits-costs		Dependent variable: attacks		Effect of independent variable on attacks (H8)					
	b	(S.E.)	b	(S.E.)	Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
R ²	.00		.20							
Member of parliament (H2a)	-.02	(.11)	-.09	(.12)	-.10	(.13)	-.09	(.12)	-.01	(.05)
Balance benefits-costs (H1)	-	-	.55***	(.04)						
Constant	3.01***	(.03)	.94***	(.12)						
R ²	.02		.22							
Running for governing party (H2b)	-.29***	(.07)	-.34***	(.07)	-.49***	(.08)	-.34***	(.07)	-.15	(.03)
Balance benefits-costs (H1)	-	-	.53***	(.04)						
Constant	3.09***	(.04)	1.11***	(.13)						
R ²	.03		.22							
Extremism (H3)	.09***	(.02)	.08***	(.02)	.13***	(.02)	.08***	(.02)	.05	(.01)
Balance benefits-costs (H1)	-	-	.54***	(.04)						
Constant	2.86***	(.05)	.82***	(.13)						
R ²	.00		.20							
Closeness of the race (H4)	.01	(.04)	-.03	(.05)	-.02	(.05)	-.03	(.05)	.01	(.02)
Balance benefits-costs (H1)	-	-	.55***	(.04)						
Constant	3.00***	(.04)	.95***	(.13)						
R ²	.00		.20							
Likelihood of getting elected (H5)	.02	(.02)	-.00	(.03)	.01	(.03)	-.00	(.03)	.01	(.01)
Balance benefits-costs (H1)	-	-	.55***	(.04)						
Constant	2.96***	(.06)	.94***	(.13)						
R ²	.01		.20							
Media coverage (H6)	.08**	(.03)	-.02	(.03)	.03	(.04)	-.02	(.03)	.05	(.02)
Balance benefits-costs (H1)	-	-	.56***	(.04)						
Constant	2.80***	(.08)	.95***	(.14)						

	Mediator: Balance benefits-costs		Dependent variable: attacks		Effect of independent variable on attacks (H8)					
	b	(S.E.)	b	(S.E.)	Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
R ²	.00		.21							
Campaign budget (H7)	-.04	(.02)	-.08**	(.02)	-.10***	(.03)	-.08**	(.02)	-.02	(.01)
Balance benefits-costs (H1)	-	-	.54***	(.04)						
Constant	3.10***	(.06)	1.16***	(.14)						

N=766 (min) to 791 (max) candidates who ran in the 2021 Baden-Württemberg state election, the 2021 Rhineland-Palatinate, or the 2021 Saxony-Anhalt state election. Models estimated using SPSS macro PROCESS, version 3.5.3, model 4 (Hayes 2018). Coefficients for the indirect effect of the dependent variable on attack behavior are bootstrapped unstandardized regression coefficients (in parentheses: standard error) (5000 iterations). Note that PROCESS does not provide a significance test for indirect effects; however, the confidence bounds in the table that do not include 0 were also marked as statistically significant when estimating the models in Stata using the command SEM. Dependent variable in all models is self-reported attack behavior. Significance levels: * p<.05, ** p<.01, ***: p<.001

Table C4: Mediation model for candidate attacking behavior (only for CDU, SPD, FDP, Bündnis 90/Die Grünen, Die Linke, AfD; in Rhineland-Palatinate also Freie Wähler)

	Mediator: Balance		Dependent		Effect of independent variable on attacks (H8)					
	benefits-costs		variable: attacks		Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
	b	(S.E.)	b	(S.E.)						
R ²	.00		.20							
Member of parliament (H2a)	-.24	(.20)	.05	(.11)	-.02	(.12)	-.05	(.11)	-.07	(.06)
Balance benefits-costs (H1)	-	-	.28***	(.02)						
Constant	-.37***	(.08)	2.63***	(.04)						
R ²	.06		.24							
Running for governing party (H2b)	-.81***	(.14)	-.37***	(.08)	-.57***	(.08)	-.37***	(.08)	-.20	(.04)
Balance benefits-costs (H1)	-	-	.25***	(.02)						
Constant	-.03	(.09)	2.79***	(.05)						
R ²	.06		.22							
Extremism (H3)	.26***	(.03)	.07**	(.03)	.14***	(.03)	.07**	(.03)	.07	(.01)
Balance benefits-costs (H1)	-	-	.26***	(.03)						
Constant	-.89***	(.12)	2.50***	(.07)						
R ²	.00		.222							
Closeness of the race (H4)	.01	(.10)	-.04	(.05)	-.04	(.06)	-.04	(.05)	.00	(.03)
Balance benefits-costs (H1)	-	-	.28***	(.02)						
Constant	-.43***	(.10)	2.66***	(.05)						
R ²	.00		.22							
Likelihood of getting elected (H5)	-.02	(.05)	.01	(.03)	-.00	(.03)	.01	(.03)	-.01	(.01)
Balance benefits-costs (H1)	-	-	.28***	(.02)						
Constant	-.36*	(.14)	2.62***	(.08)						
R ²	.00		.21							
Media coverage (H6)	.10	(.08)	.01	(.04)	.04	(.04)	.01	(.04)	.03	(.02)
Balance benefits-costs (H1)	-	-	.28***	(.02)						
Constant	-.70**	(.22)	2.61***	(.12)						

	Mediator: Balance		Dependent		Effect of independent variable on attacks (H8)					
	benefits-costs		variable: attacks		Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
	b	(S.E.)	b	(S.E.)						
R ²	.02		.21							
Campaign budget (H7)	-.16**	(.05)	-.03	(.03)	-.07*	(.03)	-.03	(.03)	-.04	(.01)
Balance benefits-costs (H1)	-	-	.27***	(.02)						
Constant	.04	(.16)	2.69***	(.09)						

N=492 (min) to 507 (max) candidates who ran in the 2021 Baden-Württemberg state election, the 2021 Rhineland-Palatinate, or the 2021 Saxony-Anhalt state election. Models estimated using SPSS macro PROCESS, version 3.5.3, model 4 (Hayes 2018). Coefficients for the indirect effect of the dependent variable on attack behavior are bootstrapped unstandardized regression coefficients (in parentheses: standard error) (5000 iterations). Note that PROCESS does not provide a significance test for indirect effects; however, the confidence bounds in the table that do not include 0 were also marked as statistically significant when estimating the models in Stata using the command SEM. Dependent variable in all models is self-reported attack behavior. Significance levels: * p<.05, ** p<.01, ***: p<.001

Table C5: Mediation model for candidate attacking behavior (Baden-Württemberg only)

	Mediator: Balance benefits- costs		Dependent variable: attacks		Effect of independent variable on attacks (H8)					
	b	(S.E.)	b	(S.E.)	Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
R ²	.00		.20							
Member of parliament (H2a)	-.35	(.29)	-.02	(.17)	-.13	(.19)	-.02	(.17)	-.10	(.08)
Balance benefits-costs (H1)	-	-	.28***	(.03)						
Constant	-.23**	(.09)	2.77***	(.05)						
R ²	.03		.20							
Running for governing party (H2b)	-.77***	(.23)	-.23	(.13)	-.44**	(.14)	-.23	(.13)	-.21	(.06)
Balance benefits-costs (H1)	-	-	.27***	(.03)						
Constant	-.14	(.09)	2.81***	(.05)						
R ²	.05		.21							
Extremism (H3)	.25***	(.05)	.10**	(.03)	.17***	(.03)	.10**	(.03)	.06	(.02)
Balance benefits-costs (H1)	-	-	.26***	(.03)						
Constant	-.70***	(.13)	2.58***	(.08)						
R ²	.00		.20							
Closeness of the race (H4)	.03	(.12)	-.01	(.07)	-.01	(.08)	-.01	(.07)	.01	(.03)
Balance benefits-costs (H1)	-	-	.28***	(.03)						
Constant	-.28*	(.11)	2.78***	(.06)						
R ²	.00		.20							
Likelihood of getting elected (H5)	-.00	(.06)	-.01	(.04)	-.01	(.04)	-.01	(.04)	-.00	(.02)
Balance benefits-costs (H1)	-	-	.28***	(.03)						
Constant	-.26	(.16)	2.80***	(.09)						
R ²	.01		.19							
Media coverage (H6)	.12	(.08)	-.02	(.05)	.01	(.05)	-.02	(.05)	.03	(.02)
Balance benefits-costs (H1)	-	-	.28***	(.03)						
Constant	-.53*	(.22)	2.84***	(.12)						

	Mediator: Balance benefits- costs		Dependent variable: attacks		Effect of independent variable on attacks (H8)					
	b	(S.E.)	b	(S.E.)	Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
R ²	.00		.20							
Campaign budget (H7)	-.07	(.06)	-.05	(.03)	-.07	(.04)	-.05	(.03)	-.02	(.02)
Balance benefits-costs (H1)	-	-	.27***	(.03)						
Constant	-.09	(.16)	2.87***	(.09)						

N=388 (min) to 403 (max) candidates who ran in the 2021 Baden-Württemberg state election. Models estimated using SPSS macro PROCESS, version 3.5.3, model 4 (Hayes 2018). Coefficients for the indirect effect of the dependent variable on attack behavior are bootstrapped unstandardized regression coefficients (in parentheses: standard error) (5000 iterations). Note that PROCESS does not provide a significance test for indirect effects; however, the confidence bounds in the table that do not include 0 were also marked as statistically significant when estimating the models in Stata using the command SEM. Dependent variable in all models is self-reported attack behavior. Significance levels: * p<.05, ** p<.01, ***: p<.001

Table C6: Mediation model for candidate attacking behavior (Rhineland-Palatinate only)

	Mediator: Balance benefits- costs		Dependent variable: attacks		Effect of independent variable on attacks (H8)					
	b	(S.E.)	b	(S.E.)	Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
R ²	.00		.17							
Member of parliament (H2a)	-.05	(.33)	-.15	(.20)	-.17	(.22)	-.15	(.20)	-.02	(.08)
Balance benefits-costs (H1)	-	-	.28***	(.04)						
Constant	-.58***	(.10)	2.65***	(.06)						
R ²	.00		.21							
Running for governing party (H2b)	-.22	(.19)	-.46***	(.11)	-.52***	(.12)	-.46***	(.11)	-.06	(.05)
Balance benefits-costs (H1)	-	-	.27***	(.04)						
Constant	-.50***	(.12)	2.82***	(.07)						
R ²	.04		.18							
Extremism (H3)	.20**	(.06)	.05	(.04)	.10*	(.04)	.05	(.04)	.06	(.02)
Balance benefits-costs (H1)	-	-	.28***	(.04)						
Constant	-.90***	(.15)	2.56***	(.10)						
R ²	.00		.18							
Closeness of the race (H4)	.07	(.14)	-.04	(.08)	-.02	(.09)	-.04	(.08)	.02	(.04)
Balance benefits-costs (H1)	-	-	.28***	(.04)						
Constant	-.63***	(.12)	2.66***	(.07)						
R ²	.00		.18							
Likelihood of getting elected (H5)	-.03	(.07)	.02	(.04)	.01	(.05)	.02	(.04)	-.01	(.02)
Balance benefits-costs (H1)	-	-	.28***	(.04)						
Constant	-.54**	(.17)	2.61***	(.11)						
R ²	.00		.17							
Media coverage (H6)	.11	(.10)	.05	(.06)	.08	(.07)	.05	(.06)	.03	(.03)
Balance benefits-costs (H1)	-	-	.28***	(.04)						
Constant	-.87**	(.26)	2.52***	(.16)						

	Mediator: Balance benefits- costs		Dependent variable: attacks		Effect of independent variable on attacks (H8)					
	b	(S.E.)	b	(S.E.)	Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
R ²	.02		.19							
Campaign budget (H7)	-.17*	(.07)	-.12**	(.04)	-.16***	(.05)	-.12**	(.04)	-.04	(.02)
Balance benefits-costs (H1)	-	-	.26***	(.04)						
Constant	-.23	(.18)	2.87***	(.11)						

N=279 (min) to 288 (max) candidates who ran in the 2021 Rhineland-Palatinate state election. Models estimated using SPSS macro PROCESS, version 3.5.3, model 4 (Hayes 2018). Coefficients for the indirect effect of the dependent variable on attack behavior are bootstrapped unstandardized regression coefficients (in parentheses: standard error) (5000 iterations). Note that PROCESS does not provide a significance test for indirect effects; however, the confidence bounds in the table that do not include 0 were also marked as statistically significant when estimating the models in Stata using the command SEM. Dependent variable in all models is self-reported attack behavior. Significance levels: * p<.05, ** p<.01, ***. p<.001

Table C7: Mediation model for candidate attacking behavior (Saxony-Anhalt only)

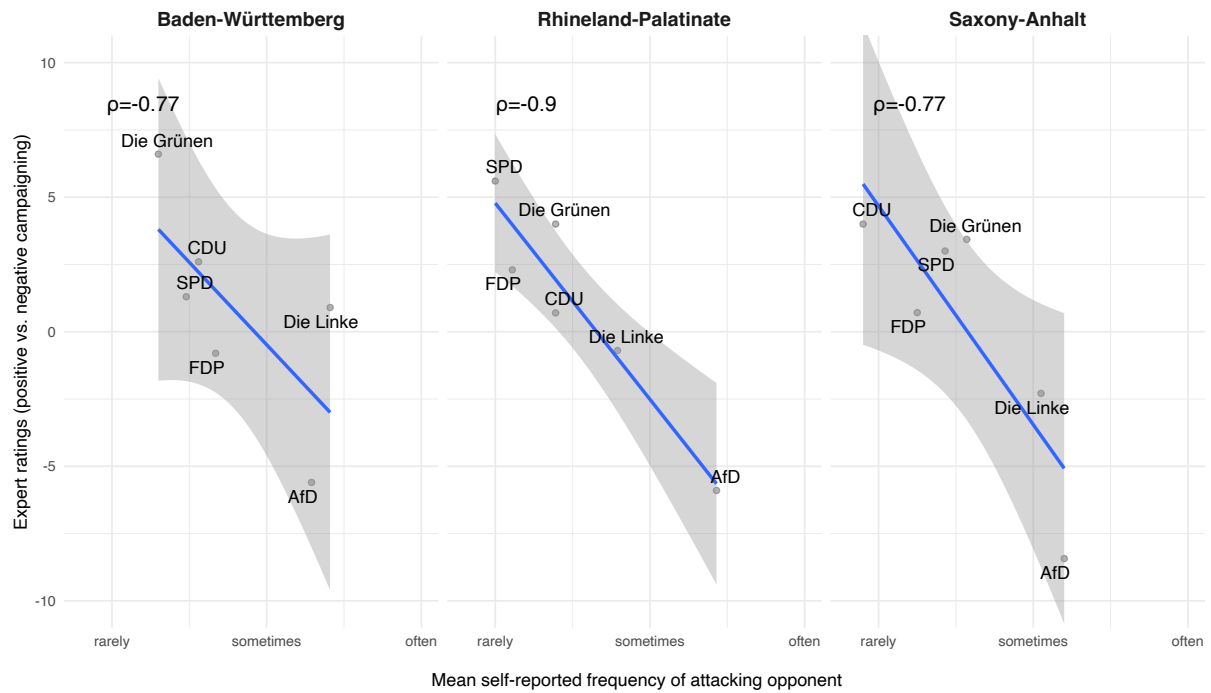
	Mediator: Balance benefits-costs		Dependent variable: attacks		Effect of independent variable on attacks (H8)					
	b	(S.E.)	b	(S.E.)	Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
R ²	.00		.22							
Member of parliament (H2a)	-.23	(.50)	.26	(.27)	.20	(.30)	.26	(.27)	-.07	(.13)
Balance benefits-costs (H1)	-	-	.28***	(.05)						
Constant	-.34*	(.16)	2.57***	(.09)						
R ²	.12		.22							
Running for governing party (H2b)	-1.14***	(.28)	-.24	(.17)	-.52**	(.18)	-.24	(.17)	-.29	(.09)
Balance benefits-costs (H1)	-	-	.25***	(.05)						
Constant	.10	(.18)	2.68***	(.10)						
R ²	.05		.23							
Extremism (H3)	.23*	(.09)	.04	(.05)	.11	(.06)	.04	(.05)	.06	(.03)
Balance benefits-costs (H1)	-	-	.27***	(.05)						
Constant	-.80***	(.23)	2.52***	(.13)						
R ²	.03		.22							
Closeness of the race (H4)	-.36	(.19)	-.05	(.10)	-.15	(.11)	-.05	(.10)	-.10	(.06)
Balance benefits-costs (H1)	-	-	.27***	(.05)						
Constant	-.15	(.20)	2.61***	(.11)						
R ²	.00		.22							
Likelihood of getting elected (H5)	.00	(.12)	.04	(.06)	.04	(.07)	.04	(.06)	.00	(.03)
Balance benefits-costs (H1)	-	-	.28***	(.05)						
Constant	-.39	(.29)	2.50***	(.16)						
R ²	.02		.23							
Media coverage (H6)	-.22	(.17)	.13	(.09)	.07	(.10)	.13	(.09)	-.06	(.06)
Balance benefits-costs (H1)	-	-	.29***	(.05)						
Constant	.26	(.48)	2.25***	(.26)						

	Mediator: Balance benefits-costs		Dependent variable: attacks		Effect of independent variable on attacks (H8)					
	b	(S.E.)	b	(S.E.)	Total	(S.E.)	Direct	(S.E.)	Indirect	(S.E.)
R ²	.05		.21							
Campaign budget (H7)	-.34*	(.14)	-.04	(.08)	-.13	(.09)	-.04	(.08)	-.09	(.04)
Balance benefits-costs (H1)	-	-	.27***	(.05)						
Constant	.32	(.34)	2.67***	(.19)						

N=116 (min) to 121 (max) candidates who ran in the 2021 Saxony-Anhalt state election. Coefficients for the indirect effect of the dependent variable on attack behavior are bootstrapped unstandardized regression coefficients (in parentheses: standard error) (5000 iterations). Note that PROCESS does not provide a significance test for indirect effects; however, the confidence bounds in the table that do not include 0 were also marked as statistically significant when estimating the models in Stata using the command SEM. Dependent variable in all models is self-reported attack behavior. Significance levels: * p<.05, ** p<.01, ***: p<.001

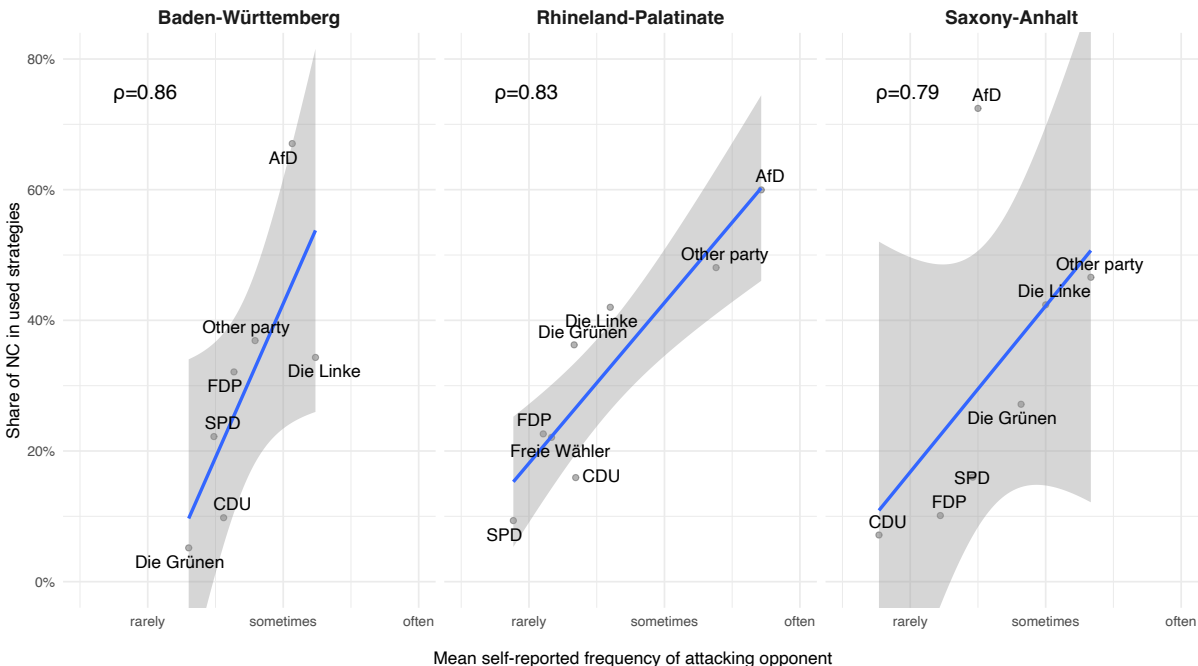
Appendix D: Comparison of self-reports with external benchmarks

Figure D1: Correlation between candidates' self-reported use of negative campaigning (aggregated by party) and expert ratings of parties' negative campaigning



Candidate self-reports: scale from 1 (“never attacked the political opponent”) to 5 (“very often attacked the political opponent”). Expert ratings: “When considering the electoral campaigns of the following actors during the most recent state election, would you say that their campaign was exclusively negative, exclusively positive or somewhere in between? Please provide a score between -10 (‘exclusively negative’) and 10 (‘exclusively positive’)”, N=8 experts (Baden-Württemberg), N=11 experts (Rhineland-Palatine), and N=7 experts (Saxony-Anhalt).

Figure D2: Correlation between candidates' self-reported use of negative campaigning and the share of candidates' use of negative campaigning on social media (aggregated by party)



Candidate self-reports: scale from 1 (“never attacked the political opponent”) to 5 (“very often attacked the political opponent”). Social media: Candidates were informed in the informed consent form that the project will link their survey responses to external data such as social media. The social media posts of candidates on Facebook, Instagram and Twitter were collected and large samples of posts coded by a team of five trained student assistants for the presence of acclaims or attacks with an interrater agreement of Krippendorffs' alpha = .88 (N_{Posts} Baden-Württemberg=6,030, N_{Posts} Rhineland-Palatine= 2,918, N_{Posts} Saxony-Anhalt= 3,279). 577 candidates who participated in the survey posted at least once on social media. To reduce noise, we calculated the share of attacks among all used strategies (acclaims and attacks) only for the 543 candidates for whom at least 2 social media posts were coded.