Steenbergen – Appendix

The Ambivalence Concept in Multi-Party Systems

Consider the case of Type-II partisan ambivalence. In two-party systems, this is commonly operationalized as

$$Amb^{II} = \frac{A_i + A_{i'}}{2} - |A_i - A_{i'}| = \frac{P_i^+ + P_i^- + P_{i'}^+ + P_{i'}^-}{4} - \left| \left(\frac{P_i^+ + P_{i'}^-}{2} \right) - \left(\frac{P_i^- + P_{i'}^+}{2} \right) \right|$$

where $A_i = .5(P_i^+ + P_{i'})$ is the attractive pull toward party P_i and $A_i = .5\left(P_i^- + P_{i'}^+\right)$. This operationalization can be found in Basinger and Lavine (2005) and Lavine (2001). Note that mathematically, $Amb^{II} \geq .5\left(Amb_i^I + Amb_{i'}^I\right)$ due to the properties of absolute values.

Now let's take this to the multi-party domain, where the pull involves *M* political parties. One could average the Type-I ambivalence values across those parties but this would potentially underestimate ambivalence, given that the average of two Type-I ambivalence values is only a lower bound for the ambivalence between any two parties. More fundamentally, the problem of the Thompson-Zanna-Griffin approach is that it was designed for 2-dimensional evaluative spaces. As we have seen already (Figure 2), in an M-party system, the evaluative space is $\mathbb{R}^M$ To handle the measurement of ambivalence in this space requires a new approach.

Let us return to Type-I ambivalence. Here we have a single party object, two evaluative dimensions, and two arousal levels. For any voter, we can represent the information using a 2×2 affect arousal matrix, AAM, like the one shown in Table A1. This is certainly not the most compact way of representing party affect. There is a clear geometric interpretation, however, as it amounts to projecting the vector from panel (a) in Figure 1 onto two axes – an x- and y-axis.

The determinant of the affect arousal matrix is

$$\det AAM_i = P_i^+ * P_i^-$$

This is twice the area underneath the vector in Figure 1, panel(a). If a voter is ambivalent about the party, then $P_i^+,\ P_i^- > 0$ and the determinant is positive.

Table A1. A $M \times M$ Pull Matric

	Pull Axis 1	Pull Axis 2	$\cdots$	Pull Axis M
Party 1	A_1	0	$\cdots$	0
Party 2	0	A_2	$\cdots$	0
$\vdots$	$\vdots$	$\vdots$	$\ddots$	$\vdots$
Party M	0	0	$\cdots$	A_M

The higher the arousal levels on the contrasting dimensions, the greater the value of the determinant will be. At maximum arousal levels, det AAM = max(P_i^+) $*$ max(P_i^-). Thus, relative degree of ambivalence is given by

$$Amb_i^I = \frac{\det AAM_i}{\max(P_i^+) * \max(P_i^-)}$$

The determinant-based measure of Type-I ambivalence is essentially a re-statement of the metric proposed by Katz et al. (1973). We can go one step further, however, by decomposing the AAM. If a voter is indifferent or univalent in her party evaluation, then one or both main diagonal values of the AAM are zero. This results in $\det AAM_i = 0$. Unlike the Thompson-Zanna-Griffin formula, then, the determinant is unable to distinguish between indifference and ambivalence. In the case of univalence, however, it is possible to define a submatrix with a non-zero determinant. This is not possible when the person is indifferent.

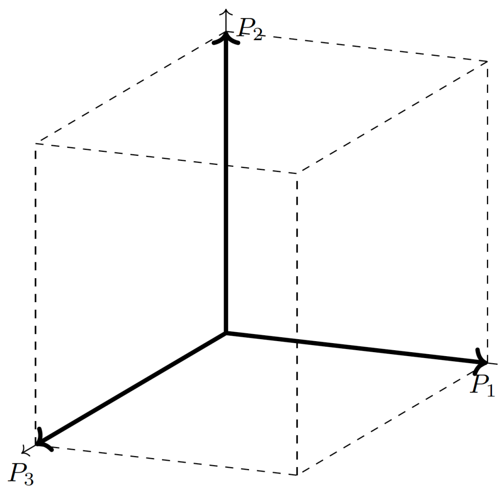
As an example, consider a voter who is univalently positive toward P_i: $P_i^+ > 0$ and $P_i^- = 0$ and $AAM[1;1]$ whose determinants equals P_i^+. Analogously, the submatrix for a univalent negative voter is $AAM[2;2]$ and this has a determinant of P_i^-.

What happens, then, when a voter is indifferent? In this case $P_i^+ = P_i^- = 0$ and $AAM_i = 0$, the null matrix. The determinants of that matrix and any conceivable sub-matrix are all 0. Thus, the use of determinants provides us with a natural way of distinguishing between indifference, univalence, and ambivalence without making a strong assumption that all of these types can be characterized through a single continuum. The drawback is that one no longer has a single measure but two different ones. However, this can be easily accommodated in empirical analyses, as we shall see.

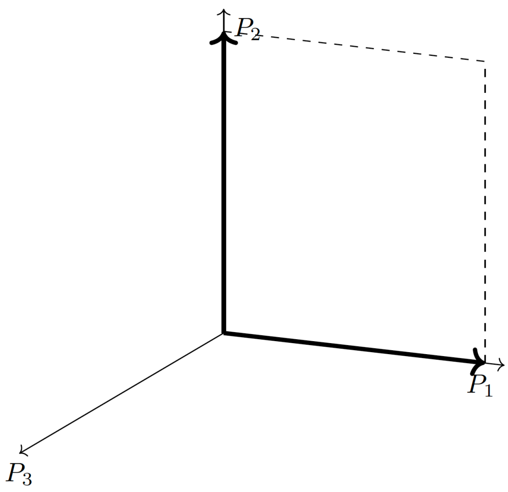
Let's now turn to the case of type-II ambivalence. We use a similar approach to create a matrix, only now I shall call it the pull matrix, PM. The general form of this matrix is shown in Table A2. Here A_i is the attractive pull toward party i. This can be zero, if there is no pull, or a positive value if there is a pull.

Figure 3 gives a geometric representation of the pull matrix I a three-party system. The left panel shows the pull toward P_1 (x-axis), P_2 (y-axis), and P_3 (z-axis). The right panel shows a voter who is equally attracted to P_1 and P_2 but feels no attraction to P_3.

Figure A1. Two Variants of Type-II Ambivalence in a 3-Party System



(a) Pull toward 3 Parties



(b) Pull toward 2 Parties

Both voters can be said to be ambivalent, although in qualitatively different ways. The qualitative differences are reflected in the matrix determinants. For the voter on the left, $\det PM = A_1 * A_2 * A_3 > 0$. This is the volume of the hypothetical cube formed by the three vectors. For the voter on the right, $\det PM = A_1 * A_2 * 0 = 0$. This is the area of the hypothetical square shown on the back panel of Figure 3.

It is also possible to distinguish between univalent and indifferent voters. For univalent voters there is exactly one party for which $A_i > 0$. A submatrix containing only this entry will thus have a non-zero determinant. For an indifferent voter, $A_i = 0$ for all parties i and no submatrix exist with a non-zero determinant.

Let us generalize these ideas by defining various forms of ambivalence. First, if a person is attracted to all political parties, he/she experiences *M*-way ambivalence to

$$\det PM = \prod_{i=1}^{M} A_i > 0$$

We can compare this value to $\prod_{i=1}^{M} \max{(A_i)}$ to obtain a relative level of M-way ambivalence.

Second, if a person is attracted to $M - 1$ parties, then she experiences $M - 1$-way ambivalence. In this case, $\det PM = 0$ because $A_i = 0$ for one particular party. However, it is possible to define a submatrix that omits the party in question. For this submatrix, the determinant is non-zero.

We can continue to reduce the space from $\mathbb{R}^{M-2}, \mathbb{R}^{M-3}$, etc. In each case, it is possible to compute a determinant for the sub-space and see if it is non-zero. Finally, if the submatrices are scalars – i.e., they have a single entry – then we have left the domain of ambivalence and entered that of univalence. If we can find $A_i > 0$, then we say the person is attracted only to that party. If we cannot find such a scalar, then we conclude that the person is indifferent.

An advantage of the determinant-based approach is that we can pinpoint quite nicely how many pull forces act on the voter and what those forces consist of. Rather than having a single ambivalence score, which could reflect moderate pulls from many parties or strong pulls from a few parties, we know who is doing the pulling and to what degree. This allows us to perform fine-grained analyses of the effects of type-II partisan ambivalence.

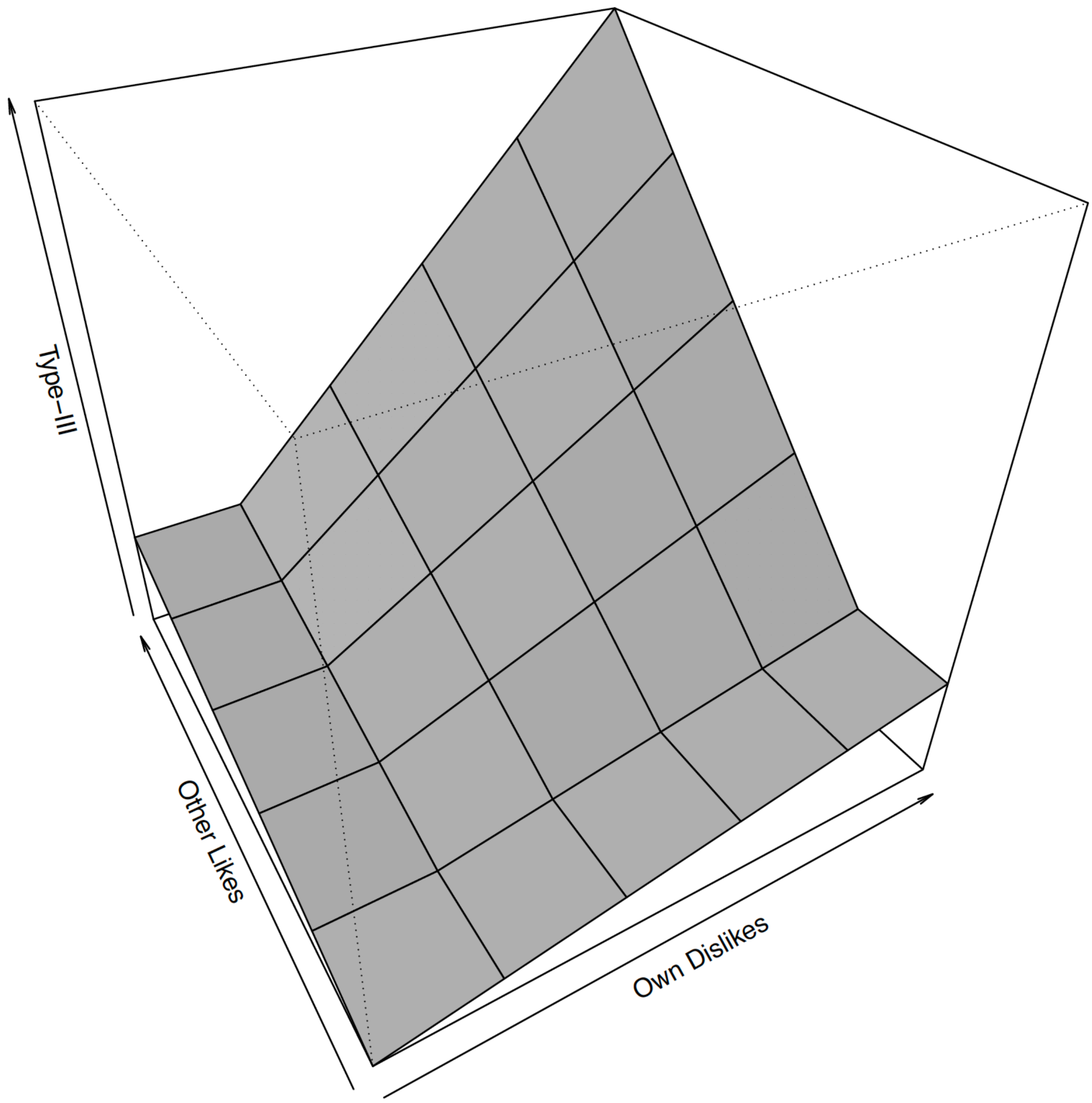
We conclude by considering Type-III ambivalence. Here, we define a conditional affect arousal matrix: given identification with party i, what is the arousal level of dissenting forms of affect. Table A3 shows this matrix. In this matrix $\bar{P}_{-i}^{+}$ denotes the average positive affect arousal level across the parties, excluding party i – the outparty affect. Further, P_i^- is the inparty affect.

Table A2. A Conditional Affect Arousal Matrix

	Arousal Axis 1	Arousal Axis 2
Negative Own party	P_i^-	0
Average Positive Other Parties	0	$\bar{P}_{-i}^{+}$

Aside from the conditioning on partisan identities, there is another important difference relative to the other ambivalence measures. Whereas in all other cases, the determinant of the 1×1 sub-matrix reflects univalence, here it actually also reflects ambivalence. Each arousal axis presents a sufficient condition for ambivalence. If someone who identifies with P_i experiences negative affect to the party, then that certainly counts as a dissenting evaluation. But so do positive evaluations of the remaining parties because, arguably, they blur the lines between partisan in- and outgroups. In this connection, it is important to point out again once more that the negative partisanship literature considers negative out-party evaluations to be of central importance to partisan identities (Maggiotto and Piereson, 1977).

Figure A2. Behaviour of Type-III Ambivalence



What does all of this mean for the measurement of Type-III partisan ambivalence? First, if one does not identify with a party, one also cannot feel ambivalent (in the Type-III sense). Second, if one identifies with a party but does not experience any dissenting party evaluations, then Type-III ambivalence is zero as well. Third, if one experiences both negative in-party affect and positive out-party affect, then Type-III ambivalence is measured as the determinant of the 2×2 conditional affect arousal matrix: $P_i^- * \bar{P}_{-i}^+$. Fourth, if a partisan experiences negative affect inparty affect but no positive outparty affect, then Type-

III ambivalence equals P_i^-. Finally, if the partisan experiences only positive outparty effect, the Type-III ambivalence is $\bar{P}_{-i}^+$. Figure 4 shows how the type-III ambivalence score is generated. Notice, the interaction between inparty negative and outparty positive arousal. I assume that the presence of both represents an ambivalence level that outpaces their sum.[1]

[1]Missing from the discussion are the so-called dominant considerations, i.e., positive inparty and negative outparty affect (Priester and Petty, 1996). We could construct a similar surface for those considerations. We would expect that surface to be situated above the surface shown in Figure 4 and never below it. The greater the gap between the two surfaces, the less ambivalence a person should experience. Thus, the volume between the dominant and dissenting surface can be used as a measure of univalence.

Table A3. Type-I Ambivalence and Response Extremity

	CDU		CSU		FDP		Greens		SPD	
	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE
Ambivalence	-0.059	0.021	-0.008	0.023	0.013	0.026	-0.080	0.029	-0.040	0.021
Univalence	0.022	0.062	0.025	0.071	0.145	0.090	-0.172	0.131	0.107	0.079
Partisan	1.018	0.107	0.589	0.121	0.468	0.264	0.624	0.252	0.963	0.107
Extremity of Left Orientation	0.102	0.038	0.188	0.043	0.129	0.040	-0.089	0.048	0.166	0.038
Extremity of Right Orientation	0.239	0.033	0.221	0.037	0.075	0.033	0.180	0.040	-0.010	0.033
Political Interest	0.149	0.040	0.217	0.046	0.082	0.044	0.055	0.052	0.149	0.041
Medium Education	-0.045	0.107	0.066	0.121	0.156	0.116	-0.149	0.140	-0.232	0.110
High Education	0.275	0.137	0.318	0.157	0.132	0.150	0.039	0.185	-0.382	0.144
Female	-0.053	0.093	-0.034	0.106	-0.088	0.101	0.095	0.122	0.012	0.096
Constant	1.756	0.155	1.457	0.177	1.510	0.160	2.778	0.197	1.873	0.162
Adj. R^2	0.236		0.123		0.022		0.046		0.176	
N	966		962		965		965		966	

Notes: Table entries are OLS regression coefficients.

Table A4. Type-I Ambivalence and Response Extremity

	CDU		CSU		FDP		Greens		SPD	
	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE
Ambivalence										
CDU/CSU-FDP-Greens-SPD	-0.008	0.004	-0.008	0.004	-0.004	0.004	-0.013	0.005	-0.008	0.004
CDU/CSU-FDP-Greens	0.033	0.071	-0.018	0.080	-0.071	0.076	-0.048	0.092		
CDU/CSU-FDP-SPD	0.043	0.075	-0.022	0.085	-0.033	0.081			-0.074	0.077
CDU/CSU-Greens-SPD	-0.031	0.030	0.026	0.034			-0.073	0.040	0.049	0.031
FDP-Greens-SPD					0.051	0.058	0.010	0.070	0.026	0.055
CDU/CSU-FDP	0.025	0.113	-0.224	0.127	-0.157	0.122				
CDU/CSU-Greens	0.147	0.306	0.288	0.345			-0.186	0.396		
CDU/CSU-SPD	-0.045	0.166	0.333	0.187					0.369	0.169
FDP-Greens					0.296	0.669	-0.780	0.806		
FDP-SPD					-0.241	0.452			0.062	0.426
Greens-SPD							-0.279	0.125	0.216	0.098
Univalence	0.040	0.171	0.106	0.193	2.660	1.504	0.304	0.468	0.711	0.380
Partisan	0.989	0.108	0.592	0.122	0.494	0.265	0.586	0.254	0.934	0.107
Extremity of Left Orientation	0.108	0.038	0.188	0.043	0.118	0.040	-0.085	0.049	0.154	0.039
Extremity of Right Orientation	0.242	0.033	0.227	0.037	0.081	0.033	0.183	0.040	0.002	0.033
Political Interest	0.135	0.040	0.220	0.045	0.090	0.043	0.051	0.052	0.143	0.041
Medium Education	-0.026	0.107	0.084	0.121	0.175	0.116	-0.159	0.140	-0.219	0.110
High Education	0.293	0.139	0.376	0.158	0.156	0.153	0.005	0.186	-0.383	0.145
Female	-0.038	0.094	-0.042	0.106	-0.081	0.101	0.104	0.122	0.019	0.096
Constant	1.693	0.151	1.458	0.172	1.568	0.157	2.700	0.189	1.816	0.159
Adj. R^2	0.227		0.128		0.020		0.047		0.182	
N	966		962		965		965		966	

Notes: Table entries are OLS regression coefficients.

Table A5. Type-I Ambivalence and Response Extremity

	CDU		CSU		SPD	
	Est	SE	Est	SE	Est	SE
Ambivalence	-0.118	0.033	-0.058	0.039	-0.185	0.034
Extremity of Left Orientation	-0.265	0.089	0.004	0.104	0.141	0.044
Extremity of Right Orientation	0.116	0.035	0.159	0.041	-0.026	0.068
Political Interest	0.183	0.053	0.195	0.062	0.175	0.054
Medium Education	-0.029	0.135	-0.017	0.159	-0.415	0.156
High Education	-0.125	0.181	-0.393	0.214	-0.745	0.237
Female	-0.042	0.121	-0.174	0.143	0.019	0.129
Constant	3.116	0.199	2.547	0.234	3.156	0.202
Adj. R^2	0.123		0.074		0.131	
N	442		441		425	

Notes: Table entries are OLS regression coefficients.