Supplementary Materials

Worksite Wellness Programs: Sticks (Not Carrots) Send Stigmatizing Signals

David Tannenbaum, Chad J. Valasek, Eric D. Knowles, Peter H. Ditto

Additional Mediation Analyses for Study 1a

We report three additional mediation analyses below. Similar to the analysis reported in the main text, all mediation analyses use policy type (stick vs. carrot policy) as the independent variable and policy evaluations as the dependent variable, and implement a bootstrapping procedure with 5,000 replications. The three analyses use the following mediators: (i) negative company attitudes towards overweight participants, (ii) positive company attitudes towards healthy-weight participants, and (iii) a difference score between the two measures (reflecting the relative amount of information conveyed about overweight vs. healthy-weight employees).

Before turning to the meditation analyses, we first report the basic pairwise associations between all measures and policy evaluations. As shown in the correlation matrix displayed in Table S1, we find a reliable relationship between policy evaluations and all of the inferential items except for positive company attitudes towards the overweight. That is, participants who viewed a policy as speaking primarily to overweight participants, or who viewed the policy as communicating negative information to overweight employees, also tended to evaluate that policy negatively (all $|rs| \geq .45$, $ps < .001$). Inferences about positive attitudes towards healthy-weight employees, on the other hand, were not correlated with policy evaluations ($r = .09$, $p = .34$).

Turning to the first mediation analysis, we find a reliable indirect effect of policy type on policy evaluations through inferences of negative company attitudes towards overweight

employees, b = –.41, 95% CI [–.89, –.02], as well as a reliable direct effect of policy type on evaluations, b = –.64, 95% CI [–1.33, –.003], suggesting partial mediation. For the second analysis, we fail to see a reliable indirect effect for inferences of positive company attitudes towards healthy-weight employees, b = –.03, 95% CI [–.28, 0.13]. This lack of mediation parallels the earlier null finding that positive company attitudes are not reliably associated with policy evaluations. Lastly, we see a reliable indirect effect when using for the difference score between the two inferential items, b = –.50, 95% CI [–.87,–.22], as well as a nonsignificant direct effect of policy type on evaluations, b = –.57, 95% CI [–1.35, 0.18], suggesting full mediation.

In short, the mediation analyses reported here are consistent with and supplement the mediation analysis provided in Study 1a — differences in evaluations between stick and carrot policies were driven by the relative informativeness of each policy. Furthermore, evaluations appear to be driven more by inferences of negative company feelings towards their overweight employees, rather than by positive company feelings towards healthy-weight employees.

Supplementary details for Study 1b Methods

The full list of dissatisfaction items were as follows. Participants were asked to imagine their employer implementing a policy like the one they read about, and to rate the degree they would "feel angry about the new policy", "feel upset about the new policy", "not feel bothered by the new policy" (reverse scored), "feel happy about the new policy" (reverse scored), "feel less satisfied working at this company", "feel more satisfied working at this company" (reverse scored), "be motivated to start looking for a new job", and "be fine staying with my current job" (reverse scored).

At the end of the survey participants were asked to report their weight and height. Using this information we calculated participant BMI as follows: BMI = (lbs/height^2) × 703.06957964. For analyses using BMI as a predictor we excluded four participants whose BMIs calculations were implausibly low (BMI < 2) and suggested a misunderstanding of the task. Including these participants strengthens the effects reported in Study 1b.

Study 1b Results: Replication of Study 1a

Manipulation Check. As intended, participants in the stick conditions were more likely to view the chosen policy as a form a punishment (combined $M = -1.68$) than were participants in the carrot condition ($M = 1.09$), $t(215) = 10.11$, $p < .001$. Means in all three stick conditions were reliably different from the mean in the carrot condition in the expected direction, ps < .001, and the three stick conditions were not reliably different from one another, ps > .15.

Inferences Drawn from Policies. The information asymmetry found in Study 1a also emerged in Study 1b. For the general informativeness item, all three stick policies were rated reliably above the scale midpoint (that the policy speaks "about the same" to both overweight and healthy-weight employees; ps < .001), while responses in the carrot condition were not reliably above the midpoint ($p = .26$). Also, similar to Study 1a we see less variance for stick policies than carrot policies ($p = .02$ by a Levene's test for the stick vs. carrot contrast), suggesting that the signals provided by stick policies were less likely to be construed differently across participants.

Looking at specific inferences, participants inferred positive information about healthy-weight employees in all four conditions (ps ≤ .002), and means in the three stick conditions (combined $M = 1.06$) were not reliably different from the mean in the carrot condition ($M =$

1.37), $t(215) = 1.32$, $p = .19$. However, participants only inferred negative information about overweight employees from stick policies: means in all three stick conditions were reliably above the midpoint of the scale (ps < .001), while the mean in the carrot policy was not ($p = .18$). Table S2 provides pairwise comparisons for all dependent measures, as well as the same four orthogonal contrasts performed in Study 1a. Again, we find that the stick vs. carrot contrast fitted the data better than any of the other alternative contrasts.

Study 1b Results: Moderated Mediation

In Study 1b high and low BMI participants interpreted stick and carrot policies in roughly the same way (i.e., inferences were not reliable moderated by participant BMI), but high BMI participants felt particularly threatened and stigmatized by stick policies. This pattern of results is suggestive of moderated mediation, where the indirect effect of policy type on feelings of stigma (or expected job dissatisfaction) through policy informativeness is qualified by participant BMI. In this path model, policy type (0 = carrot, 1 = stick) serves as the independent variable and feelings of stigma and expected job dissatisfaction serve as separate dependent variables, policy informativeness serves as the mediator variable, and participant BMI qualifies the pathway between the mediator and the dependent variable (i.e., Model 3 in Preach, Rucker, & Hayes, 2007).

Formal tests of moderated mediation were carried out using the procedures recommended by Preacher, Rucker, and Hayes (2007). Tables S3 and S4 provide regression coefficients for the independent variable to mediator pathway (top panel) and coefficients for the mediator to dependent variable pathway (middle panel). Both tables also provide estimates of the indirect effect as a function of participant BMI (bottom panel), with estimates calculated for low,

average, and high BMI participants[1] (i.e., one standard deviation below to one standard deviation above the mean). For the indirect effects, confidence intervals were calculated using bootstrapping procedures with 5,000 replications.

First, looking at feelings of stigma as the dependent variable, we find a reliable interaction effect between policy informativeness and participant BMI, $b_{intx} = –.02$, SE = .01, p = .02. As shown in the bottom panel of Table S3, the size of the indirect effect increases as participant BMI increases. A weak and unreliable indirect effect was found for low BMI participants, $b = 0.35$, 95% CI [–.02, 0.76], but larger and reliable effects were found for average BMI participants, $b = 0.59$, 95% CI [0.28, 0.96], and high BMI participants, $b = 0.83$, 95% CI [0.44, 1.31]. Looking at the observed coefficients, we see a 2.34-fold increase in the size of the indirect effect when moving from low to high BMI participants.

Next, looking at expected job dissatisfaction, we find a reliable interaction effect between policy informativeness and participant BMI, $b_{intx} = –.03$, SE = .01, $p = .001$. Shown in the bottom panel of Table S4, the size of the indirect effect again increases as a function of participant BMI. A weak and unreliable indirect effect was found for low BMI participants, b = 0.27, 95% CI [–.04, 0.61], but larger and reliable effects were found for average BMI participants, $b = 0.57$, 95% CI [0.32, 0.87], and high BMI participants, $b = 0.86$, 95% CI [0.51, 1.29]. Looking at the observed coefficients, we see a 3.12-fold increase in the size of the indirect effect when moving from low to high BMI participants. In short, we find that participants felt threatened by policies they thought communicated negative company attitudes toward overweight employees, and this was especially true for participants with high BMIs.

[1] According to classifications used by the World Health Organization (http://www.who.int/en/), the values used here for low and average BMI participants roughly correspond to the lower and upper bound of the category "Normal/Healthy-weight", and the value used for high BMI participants falls into the category "Moderately Obese".

Study 2: Do justifications reflect unconscious bias or impression management?

A stylized fact of Study 2 was that high implicit bias participants tended to choose stick policies and justify their choices by appealing to cost-effectiveness considerations, even though the results (when analyzed across conditions) indicate that choices were not sensitive to the costs associated with each policy. A reviewer of this manuscript noted that there are at least two explanations for such a pattern of results. One explanation is that the discrepancy between justification and choice reflects genuine unconscious bias — participants were simply unaware of the motivation driving their choices. Another explanation is that participants consciously chose stick policies because of their dislike for the overweight and recognized this as the basis for their choice, but endorsed a more socially-acceptable rationale (i.e., cost-effectiveness) in order to mask their prejudices.

While the results of Study 2 cannot definitively tease apart these two interpretations, we believe there are several reasons to think the unconscious interpretation is the more plausible explanation. First, Study 2 included a 10-item social desirability scale (M-C Form 1; Strahan & Gerbasi, 1972). This scale was not discussed in the main text of the manuscript due to space constraints and because the scale exhibited fairly weak psychometric properties (Cronbach's α = .51). With this caveat in mind, we find that social desirability scores are not correlated with implicit anti-fat bias (r = .08, p = .46), with choosing stick policies (r = –.07, p = .54), or with cost-effectiveness rationales (r = .05, p = .68). Furthermore, social-desirability concerns did not moderate endorsement of cost-effectiveness rationales for those high in implicit anti-fat bias (b_{intx} = –2.64, SE = 1.67, p = .12) or for those choosing stick policies (b_{intx} = 1.97, SE = 2.81, p = .49). In other words, among participants choosing stick policies (or high in implicit bias), those also high in social desirability were not reliably more likely to appeal to cost-effectiveness

considerations than those low in social desirability. These findings suggest that general self-presentation concerns were not driving cost-effectiveness rationales, though we stress again caution in interpreting these results given the weak reliability of the scale.

Second, scores on implicit anti-fat bias were uncorrelated[2] with explicit anti-fat bias (r = .11, p = .32). If high implicit bias participants were worried about how they would appear to others, then one might expect them to over-correct on the explicit anti-fat measure (which ask face valid questions about overweight bias, such as the degree to which overweight people are lazy and ugly). In other words, high implicit bias participants may have attempted to hide their prejudices against the overweight by giving relatively positive ratings on the explicit anti-fate measure, which would result in a negative correlation (rather than the positive but non-significant correlation observed). But again, this is at best indirect, and fairly weak, support for the unconscious interpretation.

Finally, perhaps the most straightforward evidence for the unconscious interpretation comes from the simple fact that participants high in explicit bias did not endorse cost-effectiveness rationales. As reported in the results section of Study 2, participants high in explicit bias were especially likely to report that their decision was based on their personal beliefs about weight (r = .30, p = .005) but not on cost-effectiveness considerations (r = .12, p = .26). We see no a priori reason to expect that high implicit bias participants, but not high explicit-bias participants, would consciously mask their prejudices.

[2] Past research using implicit measures in other domains also occasionally fail to find reliable correlations with corresponding explicit measures, especially for tasks involving socially-sensitive topics such as discrimination or prejudice (Hofmann, Gschwendner, Nosek, & Schmitt, 2005).

References

Hofmann, W., Gschwendner, T., Nosek, B. A., & Schmitt, M. (2005). What moderates implicit—explicit consistency? *European Review of Social Psychology*, *16*(1), 335-390.

Strahan, R., & Gerbasi, K. C. (2006). Short, homogeneous versions of the Marlow-Crowne Social Desirability Scale. *Journal of Clinical Psychology*, *28*(2), 191-193.

Table S1

Correlations between Policy Evaluation and Inferential Items in Study 1a

	(1)	(2)	(3)	(4)	(5)
(1) Policy Evaluations	————				
(2) General Informativeness	.59***	————			
(3) Attitudes about Healthy-weight Employees	.09	.15†	————		
(4) Attitudes about Overweight Employees	–.54***	–.39***	–.08	————	
(5) Difference score (Overweight attitudes – Healthy-weight attitudes)	–.45***	–.38***	–.68***	.78***	————

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table S2

Study 1b planned contrast tests

Statistical Comparison	Contrast Weight				Contrast test, *t*(213)				
	Carrot	Stick	Low Baseline Stick	Low Premium Stick	Stigma	Job Dissatisfaction	Informative-ness	Attitudes about Healthy-weight Employees	Attitudes about Overweight Employees
Orthogonal Contrasts									
Carrot vs. Stick	3	–1	–1	–1	2.42* *r* = .16	1.76* *r* = .16	5.29*** *r* = .42	4.63*** *r* = .30	1.41 *r* = .09
Costs to Overweight employees	1	1	–1	–1	0.31 *r* = .02	0.05 *r* = .00	2.79** *r* = .17	2.25 *r* = .15	1.20 *r* = .08
Costs to Healthy-weight employees	–1	–1	3	–1	0.67 *r* = .04	0.46 *r* = .03	1.51 *r* = .13	0.18 *r* = .01	1.34 *r* = .09
Costs to Employers	–2	–2	3	1	0.55 *r* = .03	0.22 *r* = .02	2.62** *r* = .16	1.54 *r* = .10	0.32 *r* = .02
Pairwise comparisons									
Carrot vs. Stick	1	–1	0	0	3.15** *d* = 0.62	2.94** *d* = 0.57	6.18*** *d* = 1.16	4.04*** *d* = 1.16	0.87 *d* = 0.19
Carrot vs. Low Baseline	1	0	–1	0	1.12 *d* = 0.21	1.22 *d* = .024	5.13*** *d* = 0.90	2.78** *d* = 0.90	0.07 *d* = 0.01
Carrot vs. Low Premium	1	0	0	–1	1.63† *d* = 0.34	1.68† *d* = 0.35	5.12*** *d* = 0.93	4.47*** *d* = 0.93	2.46* *d* = 0.47
Stick vs. Low Baseline	0	1	–1	0	2.13* *d* = 0.39	1.81† *d* = 0.39	1.26 *d* = 0.26	1.36 *d* = 0.26	0.82 *d* = 0.16
Stick vs. Low Premium	0	1	0	–1	1.49 *d* = 0.29	1.24 *d* = 0.33	1.03 *d* = 0.22	0.45 *d* = 0.22	1.58 *d* = 0.30
Low Baseline vs. Low Premium	0	0	1	–1	0.58 *d* = 0.11	0.52 *d* = 0.10	0.19 *d* = 0.04	1.81† *d* = 0.04	2.46* *d* = 0.44

Note. Effect sizes for the orthogonal contrasts represent the unpartialed correlation between group membership and scores on the dependent variables ($r_{effect\ size}$), and effect sizes for pairwise comparisons represent the standardized difference in the means (Cohen's d) adjusted for uneven sample sizes (Rosnow, Rosenthal, & Rubin, 2000). († $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$)

Table S3

Study 1b moderated mediation results for feelings of stigma

	Mediator Variable Model (DV: Policy Inferences)			
Predictor	*b*	SE	*t*	*p*
policy type	–1.861	0.302	6.16	< .001
constant	2.241	0.565	3.97	< .001
	Dependent Variable Model (DV: Stigma)			
Predictor	*b*	SE	*t*	*p*
policy type	0.089	0.328	0.27	0.789
policy informativeness	0.223	0.252	0.88	0.378
BMI	0.088	0.023	3.79	<.001
informativeness x BMI intx	–.021	0.009	2.34	0.020
constant	0.971	0.744	1.31	0.193
	Conditional Indirect Effects			
BMI	*b*	SE	95% CI	
19.43 (1SD below mean)	0.353	0.198	[–.022, 0.762]	
25.4 (mean)	0.589	0.170	[0.284, 0.956]	
31.38 (1SD above mean)	0.825	0.217	[0.443, 1.307]	

Note. Policy type was dummy coded as 0 = carrot, 1 = stick. All regressions implement robust standard errors. Confidence intervals for conditional/indirect effects represent bootstrapped percentile confidence intervals with 5,000 replications.

Table S4

Study 1b moderated mediation results for expected job dissatisfaction

	Mediator Variable Model (DV: Policy Inferences)			
Predictor	*b*	SE	*t*	*p*
policy type	–1.861	0.302	6.16	< .001
constant	2.241	0.565	3.97	< .001
	Dependent Variable Model (DV: Job Dissatisfaction)			
Predictor	*b*	SE	*t*	*p*
policy type	–.073	0.251	0.29	0.771
policy informativeness	0.361	0.226	1.59	0.112
BMI	0.041	0.021	1.95	0.053
informativeness x BMI intx	–.026	0.008	3.16	0.002
constant	2.699	0.683	3.95	< .001
	Conditional Indirect Effects			
BMI	*b*	SE	95% CI	
19.43 (1SD below mean)	0.275	–.001	[–.038, 0.612]	
25.40 (mean)	0.566	0.006	[0.321, 0.870]	
31.38 (1SD above mean)	0.857	0.012	[0.512, 1.287]	

Note. Policy type was dummy coded as 0 = carrot, 1 = stick. All regressions implement robust standard errors. Confidence intervals for conditional/indirect effects represent bootstrapped percentile confidence intervals with 5,000 replications.