

Supplementary Analyses

The chains on all my people are the chains on me: Restrictions to collective autonomy undermine the personal autonomy and psychological well-being of group members

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describe their core cultural group in general

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Supplemental Study 1 – Replication of Study 2 with an American MTurk Sample

We sought to replicate Study 2 with a sample of American participants recruited from MTurk. As in Study 2 we assessed the effects of perceived restrictions in collective autonomy on personal autonomy and psychological well-being assessed at 3 time-points 6 weeks apart over a four-month period. Personal autonomy and psychological well-being were assessed at all three time-points. We only assessed perceived restrictions to collective autonomy at time one given the relative stability of the construct observed in Study 2 and because we only observed effects at the between-person (trait) level of collective autonomy restrictions on personal autonomy and psychological well-being.

Method and Sample

This study was approved by the McGill REB-II under the project title: “Examination of the Role of Autonomy, Internalization, and Interpersonal Support in Goal Pursuits”.

Two-hundred and twenty-four American MTurk workers were recruited as part of a larger 3-wave longitudinal study focusing on psychological need-satisfaction and goal progress made towards New Year’s resolutions. We measured collective autonomy during the first assessment period. Two further assessments were conducted 6 weeks apart. The study was conducted in accordance with the University Research and Ethics Board and participants were compensated \$10 US for their participation. Fifty-six participants failed to complete our primary outcomes at all three time-points. A further 29 participants did not identify with a racial, ethnic, national, or religious group as their core cultural group and were excluded from our analyses. Our final sample consisted of 139 participants (73 female, 66 male; $M_{age}=38.29$, $SD=10.86$). Across the sample, participants named 54 different core cultural identities based on a national, racial, ethnic and/or religious identity.

Measures

Collective Autonomy. At time one we measured collective autonomy restrictions with the same 2 items utilized in Study 2: Items included: “Other groups have tried to control what customs and practices we should follow”; “Other groups have not tried to control what we should value and believe” (reverse scored; $r=.86$).

Personal autonomy. As in Study 2, personal autonomy felt during the last week was assessed using six items from Sheldon and Gunz (2009; $\alpha_{T1}=.84$, $\alpha_{T2}=.84$, $\alpha_{T3}=.84$). Participants’ personal autonomy scores were stable over the three time periods (mean inter-correlation = .79).

Psychological well-being. As in Study 2, psychological well-being was assessed with Diener’s life satisfaction scale ($\alpha_{T1}=.94$, $\alpha_{T2}=.95$, $\alpha_{T3}=.95$), and people’s positive affect ($\alpha_{T1}=.90$, $\alpha_{T2}=.89$, $\alpha_{T3}=.92$) and negative affect (reverse-scored; $\alpha_{T1}=.93$, $\alpha_{T2}=.95$, $\alpha_{T3}=.93$) taken from Watson and Clark (1999). At each time point we computed a composite well-being score by taking the mean of the standardized score for each index ($\alpha_{T1}=.77$, $\alpha_{T2}=.75$, $\alpha_{T3}=.75$). Psychological well-being was also stable across the three time-points (mean inter-correlation = .92).

Multi-Level Analysis Strategy

As in Study 2 we utilized a multilevel linear modeling strategy (Hayes, 2006; Raudenbush & Bryk, 2002) in which we assessed the between-person trait level effect of collective autonomy restrictions (level 2) on personal autonomy (level 1), and the between-

person indirect effect of collective autonomy restrictions on psychological well-being (level 1) through personal autonomy (i.e., a 2-1-1 multilevel mediation model). Again, a Monte Carlo simulation was used to assess the average of the random A*B slopes in the mediation model (Bauer, Preacher, & Gil, 2006) and these analyses were again run in SPSS utilizing the MLMED macro developed specifically for conducting such analyses (Rockwood & Hayes, 2017). We included time as a level 1 covariate in the model. Computation of the ICCs for each variable was computed with R (Finch, Bolin, & Kelley, 2014;) using the nlme package (Pinheiro, 2017).

Results

Means and inter-correlations for each outcome over time are summarized in Table S1. As would be expected the intraclass correlation coefficient (ICC) for personal autonomy (ICC=.66, 95%CI[.65, .67]), and psychological well-being (ICC=.77, 95%CI[.77, .78]) were large indicating that participants' own responses were strongly inter-dependent¹.

	M	SD	1	2	3	4	5	6	7
1. Collective Autonomy Restrictions (T1)	4.08	1.98		-.24**	-0.14	-.18*	-.19*	-.20*	-.22**
2. Personal Autonomy (T1)	5.05	1.21		.79***	.77***	.60***	.60***	.59***	
3. Personal Autonomy (T2)	5.01	1.21			.81***	.61***	.67***	.65***	
4. Personal Autonomy (T3)	5.10	1.23				.58***	.60***	.67***	
5. Psychological Well-Being (T1)	0.00	0.83					.94***	.91***	
6. Psychological Well-Being (T2)	0.00	0.82						.91***	
7. Psychological Well-Being (T3)	0.00	0.82							

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Table S1. Means, standard deviations and inter-correlations for Supplemental Study .1

¹ Note we could not compute an ICC for collective autonomy restrictions as we only assessed this variable at one time point.

In an initial model, we regressed personal autonomy onto time² (level 1), and people's perceived collective autonomy restrictions assessed at time 1 (level 2). Consistent with Study 2, there was a significant negative between-person effect of collective autonomy restrictions on personal autonomy, $\gamma = -.11$, $SE = .05$, 95% $CI [-.21, -.02]$, $t(137) = -2.37$, $p = .02$. There was no significant effect of time on personal autonomy, $\gamma = .03$, $SE = .03$, 95% $CI [-.04, .09]$, $t(277) = .81$, $p = .42$.

To assess the total effect of collective autonomy restrictions on psychological well-being we regressed well-being onto time and collective autonomy restrictions (assessed at time 1). Consistent with Study 2, there was a significant negative effect of collective autonomy restrictions on psychological well-being at the between-person level, $\gamma = -.09$, $SE = .03$, 95% $CI [-.15, -.02]$, $t(137) = -2.52$, $p = .01$. There was no significant effect of time on well-being, $\gamma = .00$, $SE = .01$, 95% $CI [-.03, .03]$, $t(277) = .00$, $p = 1.00$.

To assess the direct and indirect effect of collective autonomy restrictions on psychological well-being we regressed well-being onto time, collective autonomy restrictions (assessed at time 1), person-centered personal autonomy, and person-mean personal autonomy. Consistent with Study 2, personal autonomy significantly impacted well-being both at the within-person level, $\gamma = .13$, $SE = .02$, 95% $CI [.08, .17]$, $t(276) = 5.31$, $p < .001$, and at the between-person level, $\gamma = .47$, $SE = .04$, 95% $CI [.38, .56]$, $t(136) = 10.52$, $p < .001$. Indicative of mediation, the direct effect between-person effect of collective autonomy restrictions on psychological well-being was non-significant, $\gamma = -.03$, $SE = .03$, 95% $CI [-.08, .02]$, $t(136) = -1.22$, $p = .23$. Importantly supporting our mediation hypothesis, there was a significant between-person indirect effect of collective autonomy on psychological well-being through personal autonomy, $\gamma = -.05$, $SE = .02$, 95% Monte Carlo $CI [-.10, -.01]$.

Discussion

Supplemental Study 1 replicates the findings of Study 2 amongst a sample of American MTurk workers. As we found amongst the university student sample of Study 2, group members who tended to feel that the collective autonomy of their core cultural group was restricted also tended to generally experience less personal autonomous need satisfaction over a 4-month period. Furthermore, this reduced sense of personal autonomy stemming from perceived restrictions to collective autonomy had negative implications for group members' overall experience of psychological well-being over the 4-month period.

² Because there was no between-person variance for time (i.e., all participants were measured at the same time points) we omitted the between-person effect from the model.

Supplemental Analysis 1 – Study 1- Assessing Cross-Cultural Invariance of the Collective Autonomy Restriction Scale

Using multiple-group CFA (Meredith, 1993) we insured that the collective autonomy restriction scale was invariant when assessing people from relatively collectivistic cultures (i.e., participants in the present sample with an IDV score equal or less than that of India) and relatively individualistic cultures (i.e., participants with an IDV score greater than that of India). To have an optimal sample size and the statistical power required for such an analysis (i.e., a minimum of 400 participants per group; Meade, 2005) we combined the samples from Study 1 and Study 3 in which the full 8-item scale was utilized amongst a global sample recruited from MTurk and Crowd Flower. Assessing configural invariance, and serving as our baseline model, we specified the one-factor model while allowing the factor loadings, item intercepts, residual item variances, and the variance of the latent means to freely co-vary across groups. The latent means were set to equal zero. To assess weak (metric) variance we fixed the factor loadings to be equivalent across groups and assessed the resulting change in model fit relative to the configural (base-line) model. To assess strong (scalar) invariance we additionally constrained the item intercepts and fixed the latent means of one group to 0 while estimating the latent means in the other group: we compared the strong (scalar) invariance model to the weak (metric) invariance model. Lastly, in an additional model we constrained the latent means to be equivalent across groups. As illustrated in Table S2 we find evidence for configural, metric and scalar invariance, as well as equivalence in the latent means, across both cultures ($\Delta CFI < .01$; Cheung & Rensvold, 2002). As illustrated in Table S3 we also find cultural invariance when only comparing people from America and India.

	<i>df</i>	χ^2	CFI	RMSEA (90% CI)	sRMR	$\Delta \chi^2$	Δ CFI	Δ RMSEA	Δ sRMR
1. Configural Invariance (No parameters constrained)	40	199.43	0.966	0.098 [.085, .112]	0.027	NA	NA	NA	NA
2. Metric (Weak) Invariance (Intercepts constrained)	47	205.94	0.966	0.090 [.078, .103]	0.036	6.51	0.00	0.008	0.009
3. Scalar (Strong) Invariance (Intercepts and item loadings constrained)	54	251.31	0.958	0.094 [.082, .106]	0.043	45.37	0.008	0.007	0.004
4. Invariance of latent means (Intercepts, item loadings, and latent means constrained)	55	251.40	0.958	0.093 [.082, .105]	0.043	.09	0.000	0.001	0.000

Table S2. Summary of fit indices obtained from a multi-group confirmatory analysis testing the cross-cultural invariance of the collective autonomy restriction scale across relatively collectivistic and individualistic cultures. Note: CFI=comparative fit index, RMSEA = root mean square error approximation, CI= confidence intervals, sRMR= standardized root mean square intervals.

	<i>df</i>	X^2	CFI	RMSEA (90% CI)	sRMR	ΔX^2	Δ CFI	Δ RMSEA	Δ sRMR
1. Configural Invariance (No parameters constrained)	40	150.41	0.969	0.095 [.079, .111]	0.027	NA	NA	NA	NA
2. Metric (Weak) Invariance (Intercepts constrained)	47	165.15	0.967	0.091 [.076, .106]	0.046	14.74	0.002	0.004	0.019
3. Scalar (Strong) Invariance (Intercepts and item loadings constrained)	54	199.17	0.959	0.094 [.080, .108]	0.052	34.02	0.008	0.003	0.006
4. Invariance of latent means (Intercepts, item loadings, and latent means constrained)	55	203.13	0.958	0.094 [.080, .108]	0.060	3.96	0.001	0.000	0.008

Table S3. Summary of fit indices obtained from a multi-group confirmatory analysis testing the cross-cultural invariance of the collective autonomy restriction scale across American and Indian sub-samples. Note: CFI=comparative fit index, RMSEA = root mean square error approximation, CI= confidence intervals, sRMR= standardized root mean square intervals.

**Supplemental Analysis 2 - Study 1 –Regressing Psychological Well-Being onto Collective
Autonomy Restrictions and Potentially Overlapping Variables**

	Sample 1a β	95% CI	Sample 1b β	95% CI	Sample 1c β	95% CI
Step 1.						
Group Identification	.31**	.11, .49	.01	-.20, .21	-.10 [^]	-.02, .17
Collective Agency	.06	-.08, .15	-.03	-.14, .10	.09	-.01, .13
Personal Autonomy Support	-	-	.42***	.17, .55	.21***	.08, .29
Personal Regulatory Style	-	-	.12	-.05, .21	.23***	.09, .25
Collective Efficacy	-	-	-	-	.02	-.09, .12
Internal Locus of Collective Control	-	-	-	-	.13**	.03, .19
Discrimination	-	-	-	-	.05	-.02, .08
Step 2.						
Group Identification	.30**	.10, .48	.02	-.18, .21	.10 [^]	-.02, .18
Collective Agency	.02	-.10, .12	-.11	-.20, .05	.09	-.01, .13
Personal Autonomy Support	-	-	.46***	.21, .58	.21***	.08, .29
Personal Regulatory Style	-	-	.06	-.09, .17	.22***	.09, .25
Collective Efficacy	-	-	-	-	.02	-.09, .12
Internal Locus of Collective Control	-	-	-	-	.13**	.02, .19
Discrimination	-	-	-	-	.06	-.03, .09
Collective Autonomy	-.18*	-.17, -.004	-.20*	-.18, -.02	-.008	-.06, .05

Note. All covariates were entered into the first step of the regression. Collective autonomy restriction was entered into the second step of the regression. Betas pertain to standardized beta-coefficients. Significant predictors in the model are indicated by 95% confidence intervals that do not contain zero. Note: * $p < .05$, ** $p < .01$, *** $p < .001$, [^] $p < .10$.

Table S4. *Regressing Psychological Well-Being onto Collective Autonomy Restrictions*

Supplemental Analysis 3 – Study 1- Assessing Indices of Well-Being and Clinical Depression Separately

In Study 1 we assessed psychological well-being using 3 well-being indices (self-esteem, life-satisfaction, self-actualization) and a clinical measure of depression (ill-being) which was reverse scored. We sought to ensure that our results would remain consistent when assessing the three well-being measures, and the depression measure separately.

For all 3 sub-samples and with the total sample, we found that perceived collective autonomy restrictions had a significant *indirect effect* on psychological well-being via personal autonomy when assessing the three well-being measures and the depression measure separately. Table S5 summarizes analyses when only using the well-being indices and Table S6 summarizes analyses when only using the depression measure.

	Total Effect	Direct Effect	Indirect Effect
Sample 1a	Total effect =-.06, SE=.04, $t(119)=-1.41$, $p=.16$, 95% CI[-.14, .02]	Direct effect = .02, SE=.05, $t(118)=.40$, $p=.69$, 95% CI[-.07, .11]	Indirect effect =-.08, SE=.03, 95% CI [-.15, - .03]
Sample 1b	Total effect =-.10, SE=.04, $t(122)=-2.42$, $p=.02$, 95% CI[-.18, -.02]	Direct effect =-.04, SE=.04, $t(121)=-1.14$, $p=.26$ 95% CI[-.12, .03]	Indirect effect =-.06, SE=.02, 95% CI[-.11, - .02]
Sample 1c	Total effect =.006, SE=.03, $t(359)=-.20$, $p=.84$, 95% CI[-.05, .06]	Direct effect =.03, SE=.03, $t(358)=1.27$, $p=.21$, 95% CI[-.02, .09]	Indirect effect =-.03, SE=.01, 95% CI[.05, - .01]
Total sample	Total effect =-.05, SE=.02, $t(620)=-2.50$, $p=.01$, 95% CI [-.09, -.01]	Direct effect =.02, SE=.02, $t(619)=1.14$, $p=.25$, 95% CI [-.02, .06]	Indirect effect =-.07, SE=.01, 95% CI [-.10, - .05]

Table S5. Mediation analyses testing the indirect effect of collective autonomy on personal psychological well-being (not including the depression measure) via personal autonomy for each of the three sub-samples of Study 1 while controlling for potentially overlapping variables, and the total sample (no covariates were included in the total sample).

	Total Effect	Direct Effect	Indirect Effect
Sample 1a	Total effect =-.16, SE=.06, $t(119)=-2.85$, $p<.01$, 95% CI[-.27, -.05]	Direct effect =-.04, SE=.06, $t(118)=-.74$, $p=.46$, 95% CI[-.16, .07]	Indirect effect =-.12, SE=.04, 95% CI[-.22, -. .06]
Sample 1b	Total effect =-.09, SE=.06, $t(122)=-1.58$, $p=.12$, 95% CI[-.21, -.02]	Direct effect =-.02, SE=.05, $t(122)=-.28$, $p=.78$, 95% CI[-.12, .09]	Indirect effect =-.08, SE=.03, 95% CI[-.14, -. .03]
Sample 1c	Total effect =-.03, SE=.04, $t(359)=-.89$, $p=.37$, 95% CI[-.11, .04]	Direct effect =.02, SE=.04, $t(358)=.61$, $p=.54$, 95% CI[-.05, .09]	Indirect effect =-.06, SE=.02, 95% CI[-.09, -. .03]
Total sample	Total effect =-.10, SE=.03, $t(620)=-4.13$, $p<.001$, 95% CI [-.15, -.05]	Direct effect =-.009, SE=.02, $t(619)=-.37$, $p=.71$, 95% CI[-.06, .04]	Indirect effect =-.10, SE=.01, 95% CI[-.12, -. .07]

Table S6. Mediation analyses testing the indirect effect of collective autonomy on depression (reverse scored) via personal autonomy for each of the three sub-samples of Study 1 while controlling for potentially overlapping variables, and the total sample (no covariates were included in the total sample).

Supplemental Analysis 4 – Study 1- Examining the Moderating Role of Culture within each Sub-Sample of Study 1

	Culture x CA restriction interaction on personal autonomy	Index of moderated mediation for indirect effect of CA restrictions on psychological well-being
Sample 1a	$B=-.002, SE=.002, t(119)=-.79, p=.43, 95\% CI[-.01 .003]$	$IMM=-.001, SE=.001, 95\% CI[-.003, .001]$
Sample 1b	$B=.005, SE=.003, t(125)=1.69, p=.09, 95\% CI[-.001 .01]$	$IMM=.002, SE=.001, 95\% CI[-.0001, .004]$
Sample 1c	$B=-.002, SE=.001, t(363)=-1.30, p=.20, 95\% CI[-.006 .001]$	$IMM=-.001, SE=.0005, 95\% CI[-.002, .0003]$

Table S7. Moderating effect of culture on the relation between collective autonomy restriction and personal autonomy (column 1) and psychological well-being (column 2) by condition. Note: covariates were not included in the model in order to be consistent with analyses using the total sample. Betas for simple effects are non-standardized.

	Simple direct effect of CA restrictions on PA amongst relatively collectivistic individuals (-1SD)	Simple direct effect of CA restrictions on PA amongst relatively individualistic individuals (+1SD)
Sample 1a	$B=-.28, SE=.08, t(119)=-3.40, p<.001, 95\% CI[-.45, -.12]$	$B=-.37, SE=.07, t(119)=-5.39, p<.001, 95\% CI[-.50, -.23]$
Sample 1b	$B=-.32, SE=.09, t(125)=-3.67, p<.001, 95\% CI[-.49, -.15]$	$B=-.11, SE=.09, t(125)=-1.31, p=.19, 95\% CI[-.28, .06]$
Sample 1c	$B=-.15, SE=.05, t(363)=-3.10, p<.01, 95\% CI[-.25, -.06]$	$B=-.23, SE=.05, t(363)=-5.19, p<.001, 95\% CI[-.32, -.15]$

Table S8. Conditional direct effect of collective autonomy restrictions on personal autonomy for people from relatively collectivistic countries (IDV score = -1SD) and relatively individualistic countries (IDV score = +1SD). Note: Betas for simple-effects are non-standardized.

	Simple indirect effect of CA restrictions on WB amongst relatively collectivistic individuals (-1SD)	Simple Indirect Effect of CA restrictions on WB amongst relatively individualistic individuals (+1SD)
Sample 1a	$Indirect\ Effect=-.10, SE=.04, 95\% CI[-.19, -.04]$	$Indirect\ Effect=-.12, SE=.04, 95\% CI[-.22, -.06]$
Sample 1b	$Indirect\ Effect=-.13, SE=.04, 95\% CI[-.21, -.06]$	$Indirect\ Effect=-.05, SE=.03, 95\% CI[-.11, .02]$
Sample 1c	$Indirect\ Effect=-.05, SE=.02, 95\% CI[-.08, -.02]$	$Indirect\ Effect=-.08, SE=.02, 95\% CI[-.11, -.05]$

Table S9. Conditional indirect effect of collective autonomy restrictions on psychological well-being for people from relatively collectivistic countries (IDV score = -1SD) and relatively individualistic countries (IDV score = +1SD).

Supplemental Analysis 5 – Study 1 – Impact of Collective Autonomy Restrictions on Personal Autonomy and Psychological Well-Being by Cultural Sub-Groups

In addition to conducting moderated mediation analyses, we assessed the direct effect of collective autonomy restrictions on personal autonomy and the indirect effect of collective autonomy restrictions on psychological well-being when separating amongst Americans, Indians, other countries more collectivistic than India, and other countries more individualistic than India (not including America). To maximize the statistical power, analyses were conducted with the total sample of Study 1. While we had adequate samples for the Indian and American sub-groups we had limited sample size for the “other” individualistic/collectivistic clusters. As summarized in Table S9, across all sub-groups, the effects were in the hypothesized direction, and were significant amongst the American and Indian sub-samples that had adequate statistical power.

	Effect of Collective Autonomy Restrictions on Personal Autonomy	Indirect effect of Collective Autonomy Restrictions on Psychological Well-Being
Other Collectivistic Countries (N=45)	$\beta = -.21$, $t(43) = -1.40$, $p = .17$, 95% CI[-.34, .06]	Indirect effect = $-.07$, $SE = .05$, 95% CI[-.19, .03]
Indians (N=255)	$\beta = -.38$, $t(253) = -6.51$, $p < .001$, 95% CI[-.31, -.17]	Indirect effect = $-.06$, $SE = .01$, 95% CI[-.09, -.03]
Other Individualistic Countries (N=85)	$\beta = -.12$, $t(83) = -1.12$, $p = .27$, 95% CI[-.26, .07]	Indirect effect = $-.04$, $SE = .03$, 95% CI [-.11, .03]
Americans (N=234)	$\beta = -.39$, $t(232) = -6.36$, $p < .001$, 95% CI[-.35, -.19]	Indirect effect = $-.11$, $SE = .02$, 95% CI[-.15, -.07]

Table S10. Direct effect of collective autonomy restrictions on personal autonomy and indirect effect of collective autonomy restrictions on psychological well-being by cultural sub-samples. Betas pertain to standardized beta-coefficients.

Supplemental Analysis 6 – Study 1 – Repeating The Primary Analyses of Study 1 Without Excluding Participants who Failed the Manipulation Checks

We repeated the primary analyses of Study 1 for each sub-sample when including all participants who missed the attention checks included in the survey (but who otherwise passed the other exclusion criteria noted in our method). Our results did not change significantly in any of the samples when including these participants.

	Effect of Collective Autonomy Restrictions on Personal Autonomy	Indirect effect of Collective Autonomy Restrictions on Psychological Well-Being
Study 1a	$\beta = -.45$, $t(138) = -6.19$, $p < .001$, 95% CI[-.39, -.20]	Indirect effect = $-.09$, $SE = .03$, 95% CI[-.16, -.04]
Study 1b	$\beta = -.27$, $t(144) = -3.55$, $p < .001$, 95% CI[-.30, -.09]	Indirect effect = $-.07$, $SE = .02$, 95% CI[-.12, -.03]
Study 1c	$\beta = -.23$, $t(436) = -4.53$, $p < .001$, 95% CI[-.22, -.09]	Indirect effect = $-.04$, $SE = .01$, 95% CI [-.06, -.02]

Table S11. Repeating primary main-text analyses for each of the sub-samples of Study 1 when including participants who missed the attention checks imbedded in the survey. Note that for each sub-sample we included the same covariates as was included in the main-text.

Supplemental Analysis 7 – Study 1 – Repeating The Primary Analyses of Study 1 Using Multi-Level Modeling to Account for Potential Nesting Effects of Country

The data were structured such that participants were randomly nested within different countries. Across the total sample, 40.8 % of the sample resided in India, 37.6% of the sample resided in America, 10.8% of the sample resided in the UK, and the rest of the sample resided in 39 other countries. Twenty-seven of these countries were represented by only one participant.

In our primary analyses we assessed cultural generalizability by assigning participants an individualism index value (IDV; Hofstede, Hofstede & Minkov, 2010) based on their country of citizenship and then assessing whether culture moderated our effects. To complement these analyses we also ran a multi-level random intercept model (Raudenbush & Bryk, 2002) in R (Finch et al., 2014) using the lme4 package (Bates et al., 2016). In the multi-level model we treated country as a random (nesting) variable. Using 1000 boot-strapping samples we also computed the 95% confidence interval of the indirect effect of collective autonomy restrictions on psychological well-being when including country as a random variable. Providing some reassurance as to the validity of this analysis strategy there is evidence that fixed effects (which are of interest in this analysis) are stable within simple random intercept models despite there being a scarce number of clusters and multiple singleton groups. In contrast, random effects, ICCs, and more complex random slope models might be compromised with such data distributions (Bell, Ferron, and Kromrey, 2008; Clarke & Wheaton, 2007; Mass & Hox, 2004). Still, given the large number of singleton groups in our data, and thus potential concerns about the reliability of results yielded from this multi-level analysis, we view these multi-level analyses as supplemental to our primary analyses using a General Linear Model which we report in the main text. Importantly, the significance and pattern of our results were identical when using both procedures.

	Collective Autonomy Restrictions (ICC)	Personal Autonomy (ICC)	Psychological Well- being (ICC)
Sample 1a	.15	.00	.00
Sample 1b	.17	.16	.05
Sample 1c	.16	.00	.11
Total sample	.12	.00	.12

Table S12. Inter-class correlation coefficients for primary variables by each sub-sample of Study 1. Note that these estimates may be unstable given the number of singleton groups present in the data.

	Effect of collective autonomy restrictions on personal autonomy	Indirect effect of collective autonomy restrictions on psychological well-being through personal autonomy
Sample 1a	$\gamma = -.29$, 95% CI[-.40, -.19], $t(114.53) = -5.54$ $p < .001$, $r = .46$	95% CI[-.16, -.03]
Sample 1b	$\gamma = -.17$, 95% CI[-.29, -.05], $t(122) = -2.77$ $p = .007$, $r = .24$	95% CI[-.11, -.02]
Sample 1c	$\gamma = -.15$, 95% CI[-.22, -.08], $t(356) = -4.11$ $p < .001$, $r = .44$	95% CI[-.06, -.02]
Total sample	$\gamma = -.22$, 95% CI[-.27, -.17], $t(617) = -8.75$ $p < .001$, $r = .33$	95% CI[-.10, -.06]

Table S13. Repeating primary main-text analyses of Study 1 when utilizing a multi-level random-intercepts model that accounts for potential non-independence of people nested within the same country. Note that for each sub-sample we included the same covariates as was included in the main-text. For the total sample no covariates were included in the model.

Supplemental Analyses 8- Study 3 – Repeating the Key Analyses of Study 3 when Including Participants Asked to Describe their Core Cultural Group in General

Beyond the two primary conditions focused on in the main text (i.e., the collective autonomy restriction condition and the collective autonomy condition) we also included a condition in which participants were asked to describe the customs and practices of their core cultural group in general, which we refer to as the “neutral” condition. We repeated our main-text analyses this time including participants from all three conditions (See Table S14 and Table S15). Participants in the neutral condition reported significantly higher levels of collective autonomy restriction relative to participants assigned to the collective autonomy condition, yet did not differ in their perceptions of collective autonomy restriction relative to those assigned to the collective autonomy restriction condition. Participants in the neutral condition also did not differ significantly from those assigned to the two other conditions with respect to personal autonomy or psychological well-being. Importantly however, our key contrast comparing those in the collective autonomy restriction condition to those in the collective autonomy support condition were consistent with our main text analyses: describing an intergroup event during which one’s ingroup lacked rather than had collective autonomy led to significant reductions in personal autonomy, and in turn, significantly lowered psychological well-being.

	<i>F</i> Statistic	Restriction vs. Neutral (<i>Mean Difference</i>)	Restriction vs. Collective Autonomy (<i>Mean Difference</i>)	Neutral vs. Collective Autonomy (<i>Mean Difference</i>)
Collective Autonomy Restriction	$F(2,507)=6.73, p<.001,$ $\eta^2=.03$	$MD=.09, p=.58, 95%$ CI[-.23,.41]	$MD=.60, p=.001, 95%$ CI[.23,.96]	$MD=.50, p=.001, 95%$ CI[.20,.81]
Personal Autonomy	$F(2,507)=2.34, p=.10,$ $\eta^2=.01$	$MD=-.21, p=.08, 95%$ CI[-.45,.02]	$MD=-.28, p=.04, 95%$ CI[-.55,-.01]	$MD=-.07, p=.56, 95%$ CI[-.29,.16]
Psychological Well- being	$F(2,507)=1.59, p=.21,$ $\eta^2=.01$	$MD=-.02, p=.86, 95%$ CI[-.19,.15]	$MD=-.15, p=.13, 95%$ CI[-.34,.04]	$MD=-.13, p=.11, 95%$ CI[-.30,.03]

Table S14. Repeating the analyses of Study 3 when including participants who were randomly assigned to describe their core cultural group in general (which we refer to as the neutral condition). Consistent with the main-text analyses, we found that describing an instance of collective autonomy restriction relative to an instance of having collective autonomy significantly reduced group members’ personal autonomy.

	Total Effect	Direct Effect	Indirect Effect
Collective Autonomy Restriction vs. Neutral	Total effect = .02, <i>SE</i> = .09, <i>p</i> = .86, 95% CI [-.15, .19]	Direct effect = -.06, <i>SE</i> = .08, <i>p</i> = .44, 95% CI [-.21, .09]	Indirect effect = .07, <i>SE</i> = .04, 95% CI [-.01, .16]
Collective Autonomy Restriction vs. Collective Autonomy	Total effect = .15, <i>SE</i> = .10, <i>p</i> = .13, 95% CI [-.04, .34]	Direct effect = .05, <i>SE</i> = .09, <i>p</i> = .55, 95% CI [-.12, .22]	Indirect effect = .10, <i>SE</i> = .05, 95% CI [.004, .20]
Neutral vs. Collective Autonomy	Total effect = .13, <i>SE</i> = .08, <i>p</i> = .11, 95% CI [-.03, .30]	Direct effect = .11, <i>SE</i> = .07, <i>p</i> = .13, 95% CI [-.03, .25]	Indirect effect = .02, <i>SE</i> = .04, 95% CI [-.06, .10]

Table S15. Mediation analyses (PROCESS, Model 4, 5,000 boot-strapping confidence intervals) testing the indirect effect of condition on personal psychological well-being via personal autonomy when including participants assigned to describe their core cultural group in general (Study 3). Consistent with our main-text analyses, describing an instance of collective autonomy restriction relative to an instance of collective autonomy had a significant indirect effect on group members' psychological well-being (analysis described in middle row).

Supplemental Analysis 9 – Study 3 - Repeating the Primary Analyses of Study 3 Including Participants Who Failed Attention Checks

We repeated the primary analyses of Study 3 when including all participants who missed the three primary attention checks included in the survey (but who otherwise passed the other exclusion criteria noted in our method). Our results did not change significantly when including these participants (total N = 327).

Effect of condition on perceived collective autonomy restrictions (manipulation check)	$F(1,325)=11.39, p<.001, \eta^2=.03$
Effect of condition on personal autonomy	$F(1,325)=5.18, p=.02, \eta^2=.02$
Effect of condition on psychological well-being	$F(1,325)=3.56, p=.06, \eta^2=.01$
Indirect effect of condition on psychological well-being through personal autonomy	$Indirect\ Effect=.10, SE=.04, 95\% CI[.02, .20]$

Table S16. Repeating the primary main-text analyses of Study 3 when including participants who failed attention checks.

Supplemental Analysis 10 – Study 3 – Assessing the Indirect Effect of Condition on Psychological Well-Being and Depression Separately

We examined whether condition had differential effects on psychological well-being (Self-Esteem, Life-Satisfaction, Self-Actualization) and depression (reversed-coded). We found our results to be consistent using both measures: Condition had a significant indirect effect on both outcomes though personal autonomy.

	Effect of Condition on Outcome	Indirect Effect of Condition on Outcome
Well-Being Indices (Life-Satisfaction, Self-Esteem, Self-Actualization)	$F(1,253)=1.87, p=.17, \eta^2=.01$	<i>Indirect Effect</i> =.10, <i>SE</i> =.05, 95% CI[.001, .21]
Depression (Reverse Scored)	$F(1,253)=3.78, p=.05, \eta^2=.02$	<i>Indirect Effect</i> =.11, <i>SE</i> =.06, 95% CI[.002, .23]

Table S17. *Effect of condition on indices of well-being and depression (Study 3).*

Supplemental Analysis 11 –Study 3 – Repeating Primary Analyses of Study 3 Using Multi-Level Modeling to Account for Potential Nesting Effects of Country

The data were structured such that participants were randomly nested within different countries. Across the total sample, 31.9 % of the sample resided in India, 34.4% of the sample resided in America, 9.2% of the sample resided in the Philippines, and the rest of the sample resided in 25 other countries. Nine of these countries were represented by only one participant.

We ran a multi-level random intercept model (Raudenbush & Bryk, 2002) in R (Finch et al., 2014) using the lme4 package (Bates et al., 2016). In the multi-level model we treated country as a random (nesting) variable. Condition was entered as a dummy coded variable (Restriction=1, Support =2). The significance and pattern of our results found using this multi-level strategy was consistent with the results reported in the main text using the GLM.

	Interclass Correlation Coefficient (ICC)
Collective Autonomy Restrictions	.00
Personal Autonomy	.00
Psychological Well-being	.11

Table S18. *Inter-class correlation coefficients for primary variables of Study 3. Note that these estimates may be unstable given the number of singleton groups present in the data.*

Effect of condition on perceived collective autonomy restrictions (manipulation check)	$\gamma = -.62$, 95% CI[-1.00, -.25], $t(251) = -3.26$, $p = .001$, $r = .20$
Effect of condition on personal autonomy	$\gamma = .29$, 95% CI[.01, .57], $t(251.00) = 2.06$, $p = .04$, $r = .13$
Effect of condition on psychological well-being	$\gamma = .19$, 95% CI[-.002, .38], $t(250.07) = 1.94$, $p = .05$, $r = .12$
Indirect effect of condition on psychological well-being through personal autonomy	Indirect Effect: 95% CI[.01, .21]

Table S19. *Repeating primary main-text analyses of Study 3 when utilizing a multi-level random-intercepts model that accounts for the potential non-independence of people nested within the same country.*

Supplemental Analyses 12 – Study 4 - Repeating the Primary Analyses of Study 4 when Subdividing the Sample by the Year in which the Study was Conducted

Data collection for Study 4 was conducted over a period of two years. Two hundred and nineteen participants were recruited in year one. After excluding participants with missing data, 213 participants remained (50 groups: collective autonomy restriction, N= 73, 16 groups; collective autonomy support, N= 64, 16 groups; control condition, N=76, 18 groups). During the second year 196 participants were recruited. Twenty participants were excluded because of missing data. Thus, 176 participants (45 groups) remained in the year-two sample (collective autonomy restriction, N= 58, 15 groups; collective autonomy support, N= 56, 14 groups; control condition, N=62, 16 groups).

To gain further confidence in our results, we repeated our primary analyses when sub-dividing our sample on the basis of which year participants took part in the study. The effect sizes and pattern of results when sub-dividing the data on the basis of the year for both sub-samples are consistent with what we find with the total sample, and support for our primary hypotheses (See Table S20). However, because of limited statistical power due to reduced sample sizes we recommend interpreting the results of the individual sub-samples with caution.

To gain further confidence that the year during which the study was conducted did not impact how participants responded to condition, we repeated our primary analyses using the total sample when controlling for the year during which participants took part in the study (See Table S21). Consistent with the results reported in the main text, condition had a significant effect on personal autonomy and participants' satisfaction with their in-game avatar while controlling for the year during which the study was run. Importantly, the year during which the study was run had no significant effect on these key outcomes. Furthermore, additional analysis in which we included an interaction between year and condition on our key outcomes found no significant interaction for either outcome. Thus, it appears that the effect of condition on our outcomes was the same regardless of which year the study was run.

Outcome	Sample	Power	Model Fit (vs. Null Model)	Restriction vs. Control	Restriction vs. Support	Control vs. Support
Collective Autonomy Restriction	Year 1	1.00	$\chi^2=96.26, p < .001, R^2_I=.48$	$\gamma=-2.64, 95\% \text{ CI} [-2.99, -2.29], t(46.56)=-14.84, p < .001, r=.91$	$\gamma=-2.45, 95\% \text{ CI} [-2.81, -2.09], t(47.29)=-13.31, p < .001, r=.89$	$\gamma = .19, 95\% \text{ CI} [-0.17, .55], t(51.11)=-1.04, p=.30, r=.14$
	Year 2	1.00	$\chi^2=75.06, p < .001, R^2_I=.44$	$\gamma=-2.32, 95\% \text{ CI} [-2.71, -1.92], t(42.29)=-11.37, p < .001, r=.87$	$\gamma=-2.58, 95\% \text{ CI} [-2.98, -2.17], t(39.81)=-12.36, p < .001, r=.89$	$\gamma=-.26, 95\% \text{ CI} [-0.66, .14], t(40.61)=-1.27, p=.21, r=.20$
	Combined Sample	1.00	$\chi^2=168.23, p < .001, R^2_I=.46$	$\gamma=-2.49, 95\% \text{ CI} [-2.75, -2.23], t(91.88)=-18.59, p < .001, r=.89$	$\gamma=-2.51, 95\% \text{ CI} [-2.78, -2.24], t(90.12)=-18.20, p < .001, r=.89$	$\gamma=-.02, 95\% \text{ CI} [-0.29, .25], t(95.18)=-0.13, p=.90, r=.01$
Satisfaction with In-Game Avatar	Year 1	.67, .80	$\chi^2=8.67, p=.01, R^2_I=.11$	$\gamma=.38, 95\% \text{ CI} [.06, .69], t(210)=2.36, p=.02, r=.16$	$\gamma=.45, 95\% \text{ CI} [.12, .78], t(210)=2.71, p=.007, r=.18$	$\gamma = .08, 95\% \text{ CI} [-0.25, .40], t(210)=0.46, p=.65, r=.03$
	Year 2	.60, .83	$\chi^2=8.70, p=.01, R^2_I=.001$	$\gamma=.43, 95\% \text{ CI} [.05, .80], t(40.54)=2.18, p=.04, r=.32$	$\gamma=.58, 95\% \text{ CI} [.19, .97], t(39.09)=2.87, p=.007, r=.42$	$\gamma=.15, 95\% \text{ CI} [-0.24, .54], t(39.14)=0.77, p=.45, r=.12$
	Combined Sample	.92, .98	$\chi^2=17.43, p < .001, R^2_I=.10$	$\gamma=.40, 95\% \text{ CI} [.16, .63], t(88.51)=3.26, p < .001, r=.33$	$\gamma=.51, 95\% \text{ CI} [.27, .76], t(88.65)=4.06, p < .001, r=.40$	$\gamma=.11, 95\% \text{ CI} [-0.13, .36], t(91.88)=-0.91, p=.36, r=.09$
Personal Autonomy	Year 1	.44, .48	$\chi^2=4.82, p=.09, R^2_I=.01$	$\gamma=.32, 95\% \text{ CI} [.00, .65], t(210)=1.95, p=.05, r=.13$	$\gamma=.31, 95\% \text{ CI} [-0.02, .65], t(210)=1.82, p=.07, r=.12$	$\gamma = -.01, 95\% \text{ CI} [-0.34, .33], t(210)=-0.05, p=.96, r=.003$
	Year 2	.20, .32	$\chi^2=2.75, p=.25, R^2_I=.02$	$\gamma=.22, 95\% \text{ CI} [-0.14, .58], t(173)=1.21, p=.23, r=.09$	$\gamma=.30, 95\% \text{ CI} [-0.07, .67], t(173)=1.58, p=.12, r=.12$	$\gamma=.08, 95\% \text{ CI} [-0.29, .44], t(173)=0.41, p=.69, r=.03$
	Combined Sample	.64, .71	$\chi^2=7.39, p=.03, R^2_I=.01$	$\gamma=.28, 95\% \text{ CI} [.04, .52], t(386)=2.27, p=.02, r=.11$	$\gamma=.31, 95\% \text{ CI} [.06, .56], t(386)=2.43, p=.02, r=.12$	$\gamma=.03, 95\% \text{ CI} [-0.22, .28], t(386)=0.24, p=.81, r=.01$

Table S20. The effect of condition on outcomes by the year during which Study 4 was conducted. Observed (post-hoc) power estimates are provided for the 2 contrasts hypothesized to be significant (i.e., Restriction vs. Control and Restriction vs. Support).

Outcome	Effect of Year on Outcome	Model Fit (vs. Covariate Model)	Threat vs. Control	Threat vs. Support	Control vs. Support
Satisfaction with In-Game Avatar	$\gamma=.15$, 95% CI[-.06, .37], $t(90.76)=1.40$ $p=.17$, $r=.15$	$\chi^2=17.73$, $p=.001$, $R^2_I=.10$	$\gamma=.40$, 95% CI[.16, .63], $t(87.13)=3.82$ $p=.001$, $r=.38$	$\gamma=.51$, 95% CI[.26, .75], $t(87.40)=4.06$, $p<.001$, $r=.40$	$\gamma=.11$, 95% CI[-.13, .35], $t(90.55)=.90$, $p=.37$, $r=.09$
Personal Autonomy	$\gamma=.02$, 95% CI[-.19, .22], $t(387.00)=.15$ $p=.88$, $r=.01$	$\chi^2=7.38$, $p=.03$ $R^2_I=.01$	$\gamma=.28$, 95% CI[.04, .52], $t(385.00)=2.27$ $p=.02$, $r=.11$	$\gamma=.31$, 95% CI[.06, .56], $t(385.00)=2.42$, $p=.02$, $r=.12$	$\gamma=.03$, 95% CI[-.22, .27], $t(385.00)=.24$, $p=.81$, $r=.01$

Note: Study was dummy coded such that Year One was equal to “0” and Year Two was equal to “1”

Table S21. *The effect of condition on the primary outcomes of personal autonomy and satisfaction with one’s in-game avatar while controlling for the year during which the study was run (Study 4).*

Supplementary Analyses 13 –Study 4– Repeating the Analyses of Study 4 Controlling for the Number of People in Participants’ Unique Group

Depending on whether or not all participants who were scheduled to partake in the experiment chose to attend the lab session, the size of our randomly created groups varied from 3 to 5 people. We wanted to ensure that size of group did not significantly impact our outcomes of satisfaction with one’s in-game avatar or perceptions of personal autonomy. We found no significant effect of group size on group members’ reported satisfaction with their in-game avatar or on their level of personal autonomy during the experiment. Furthermore, the effect of condition on these outcomes remained significant when controlling for group size (see Table S22).

Outcome	Effect of Group Size on Outcome	Model Fit (vs. Covariate Model)	Threat vs. Control	Threat vs. Support	Control vs. Support
Satisfaction with In-Game Avatar	$\gamma=.07$, 95% CI[-.09, .23], $t(102.30)=.82$, $p=.42$, $r=.08$	$\chi^2=18.02$, $p<.001$, $R^2_{level_change}=.10$	$\gamma=.41$, 95% CI[.17, .65], $t(88.29)=3.35$, $p=.001$, $r=.34$	$\gamma=.52$, 95% CI[.27, .76], $t(88.32)=4.08$, $p<.001$, $r=.40$	$\gamma=.11$, 95% CI[-.14, .35], $t(91.28)=.85$, $p=.40$, $r=.09$
Personal Autonomy	$\gamma=-.10$, 95% CI[-.25, .06], $t(387.00)=-1.25$, $p=.21$, $r=.06$	$\chi^2=6.99$, $p=.03$, $R^2_{level_change}=.01$	$\gamma=.27$, 95% CI[.02, .51], $t(385.00)=2.16$, $p=.03$, $r=.11$	$\gamma=.30$, 95% CI[.05, .55], $t(385.00)=2.39$, $p=.02$, $r=.12$	$\gamma=.04$, 95% CI[-.21, .28], $t(385.00)=.30$, $p=.76$, $r=.02$

Table S22. *The effect of condition on the primary outcomes of personal autonomy and satisfaction with one’s in-game avatar while controlling for the size of participants’ unique group (Study 4)*

Supplementary Analyses 14 – Study 4 – Repeating the Analyses of Study 4 Controlling for Group Members’ Baseline Enjoyment of Playing Video Games in General

It is possible that the extent to which participants generally enjoy playing video games may have impacted the extent to which they were satisfied with their in-game avatar or felt personally autonomous to play video games during the experiment. As such, we wanted to ensure that our results would not change when controlling for group members’ baseline enjoyment of playing video games in general. We assessed participants’ enjoyment of playing video games in general with the item: “How much do you enjoy playing video games or computer games in general”. As expected, our results did not change when controlling for group members’ general enjoyment of playing video games.

Outcome	Effect of Enjoyment Of Video Games	Model Fit (vs. Covariate Model)	Threat vs. Control	Threat vs. Support	Control vs. Support
Satisfaction with In-Game Avatar	$\gamma=.03$, 95% CI[-.02, .08], $t(382.60)=1.20$, $p=.23$, $r=.06$	$\chi^2=17.66$, $p<.001$, $R^2_I=.11$	$\gamma=.40$, 95% CI[.16, .64], $t(87.20)=3.32$, $p=.001$, $r=.33$	$\gamma=.51$, 95% CI[.26, .75], $t(87.30)=4.06$, $p<.001$, $r=.40$	$\gamma=.11$, 95% CI[-.13, .35], $t(90.80)=.87$, $p=.39$, $r=.09$
Personal Autonomy	$\gamma=.16$, 95% CI[.11, .20], $t(387.00)=6.73$, $p<.001$, $r=.32$	$\chi^2=8.15$, $p=.02$, $R^2_I=.01$	$\gamma=.29$, 95% CI[.07, .52], $t(385.00)=2.53$, $p=.01$, $r=.13$	$\gamma=.29$, 95% CI[.05, .52], $t(385.00)=2.41$, $p=.02$, $r=.12$	$\gamma=.00$, 95% CI[-.24, .23], $t(385.00)=-.03$, $p=.98$, $r=.00$

Table S23. *The effect of condition on the primary outcomes of personal autonomy and satisfaction with one’s in-game avatar while controlling for participants’ baseline enjoyment of video game (Study 4). We grand-mean centered participants’ baseline enjoyment of video games (Hayes, 2006). We compared the proposed model to a model only including group members’ baseline enjoyment of video games.*

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