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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October 22, 2017

Authors’ note:

This research was supported by research grants from the Social Sciences and Humanities Research Council (SSHRC - 890-2011-0141) and the Fonds Québécois de Recherche sur la Société et la Culture (FQRSC-2013-SE-164404) awarded to Taylor. This research was supported by the SSHRC grant awarded to Richard Koestner (SSHRC-435-2014-20463). This research was also supported by a doctoral scholarship from SSHRC (CGSD 767-2013-1903) awarded to Kachanoff. We would like to thank Richard Koestner, Anne Holding and the Koestner Lab for allowing us to include our collective autonomy measure in their longitudinal surveys. We would like to thank Tania Dargy, Jing Fei Wang, Julie Rivest, and Hyun Joon Park for their help implementing this research. We would also like to thank Nour Kteily and Richard Koestner for providing us with valuable feedback on our manuscript. We would like to thank Ryan Braun for programming the multiplayer video game, and coat of arms generator used in this research. Finally, we would like to thank Rhonda Amsel, Emilie Auger, Philippa Clarke, Lise Jans, and Nicholas Rockwood for their advice with respect to our statistical analyses.

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Abstract

Four studies assessed the potentially detrimental effects that restrictions to collective autonomy (i.e., a group’s freedom to determine and practice its own identity) may have for the personal autonomy and psychological well-being of group members. In Study 1, using three distinct samples ($N_{Sample1a} = 123$, $N_{Sample1b} = 129$, $N_{Sample1c} = 370$), correlational and cross-cultural evidence indicates that perceived restrictions to the collective autonomy of one’s group is directly associated with reduced personal autonomy, and indirectly associated with diminished well-being through personal autonomy. In Study 2 ($N=411$), a longitudinal assessment of group members over three time-points during a four-month period found that group members who perceived greater collective autonomy restriction also experienced reduced personal autonomy, and in turn, reduced psychological well-being over time. In Study 3 ($N=255$), group members described a time during which their ingroup had (or did not have) its collective autonomy unduly restricted by other groups. Participants who were primed to think that their group lacked collective autonomy reported reduced feelings of personal autonomy, and reduced psychological well-being (compared to those primed to think their group had collective autonomy). In Study 4 ($N=389$), collective autonomy was manipulated within the context of an intensive laboratory simulation. Collective autonomy-restricted group members experienced less personal autonomy than those who did not have their collective autonomy restricted. Together these findings suggest that restrictions to a group’s collective autonomy may have detrimental consequences for the personal autonomy and psychological well-being of group members.

Key words: Collective Autonomy; Personal Autonomy; Psychological Well-Being; Social Identity
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“Freedom is indivisible; the chains on any one of my people were the chains on all of them, the chains on all of my people were the chains on me.” (Nelson Mandela, 1995, Long Walk to Freedom)

The shared norms, values, goals, and customs that become associated with social categories are the very essence of a meaningful social identity (Tajfel & Turner, 1979; Taylor, 2002; Triandis & Gelfand, 1998). Herein, we ask whether all social groups feel that they are the authors of their own social identity. That is, we assess the extent to which group members feel that their collective autonomy—their group’s freedom to define and practice its own identity—has been unduly restricted by other groups in society. A fundamental truth is that some groups in society lack collective autonomy. Societal policies, for example, prevent members of certain groups from expressing their cultural practices in public. Even in countries where multiculturalism is generally celebrated, there have been initiatives to restrict certain religious minorities from openly expressing their culture (Adrian, 2015; Flanagan, 2014). For example, in France, Muslim women are not permitted to wear facial coverings such as burqas and niqabs in public spaces. At the extreme—in instances of forceful assimilation, colonization and slavery—oppressed groups may be forced to eschew their culture altogether. This has been a stark reality for many disadvantaged groups including Indigenous groups (Taylor & de la Sablonnière, 2014; Truth and Reconciliation Canada, 2015), African Americans (Fields, 1990), certain ethnic minorities in the Middle East (Baran, 1986; Gunes, 2013), and formerly colonized peoples in Africa (Mandela, 1995).
In the current research, we examined the potentially deleterious effects that restrictions to collective autonomy may have for the psychological health of group members—a topic with important social implications that has yet to receive empirical attention. To this end, we integrate theories of human motivation that document the psychological necessity of feeling personally autonomous (Ryan & Deci, 2017) with theories of social identity that document the functional role of social identity for defining the self-concept and orienting one’s behavior (Greenaway et al., 2015; Oyserman, 2007; Taylor, 2002). Specifically, we test the novel idea that intergroup contexts in which a group lacks, rather than enjoys, collective autonomy will be less satisfying to group members’ basic psychological need for personal autonomy. Furthermore, we argue that by undermining personal autonomy, intergroup contexts in which groups are deprived of collective autonomy will also negatively impact an important health outcome robustly associated with personal autonomy: psychological well-being. This research illuminates how perceptions of one’s intergroup context might impact basic psychological needs that drive human motivation, and are essential for optimal psychological growth and functioning.

The Impact of Social Contexts on Personal Autonomy

Personal autonomy involves the sense of volition and authenticity that arises when people feel that they are free to determine their own personal identity (i.e., their own values, goals, and aspirations) and act in accordance with that identity (Deci & Ryan, 2000; Weinstein, Przybylski, & Ryan, 2012). Conversely, feeling that others attempt to personally control, manipulate, or pressure one to act in a certain way may undermine one’s personal autonomy (Chen et al., 2015). Self-determination theory—a meta-theory of human motivation and well-being (SDT; Deci & Ryan, 2000; Ryan & Deci, 2017)—provides extensive evidence that personal autonomy is positively associated with psychological well-being across cultures (Chen et al., 2015; Chen,
Van Assche, Vansteenkiste, Soensens, & Beyers, 2015; Chirkov, Ryan, Kim, & Kaplan, 2003; Deci, et al., 2001; Vansteenkiste, Ryan & Deci, 2008). On this basis, SDT argues that personal autonomy constitutes a basic psychological need.

Increasingly, research applying the SDT framework has considered how pervasive social contexts, including cultural and religious identities, as well as political and economic systems, may affect personal autonomy (see Ryan & Deci, 2017 for a review). This research has found that feelings of personal autonomy and psychological well-being are, in part, related to whether group members choose to conform to social norms (Amiot, Sansfacon, & Louis, 2013; Amiot, Sansfacon, Louis, & Yelle, 2012), identify with their group (Amiot & Aubin, 2013; Amiot & Sansfacon, 2011), and engage in their cultural customs and practices (Chirkov et al., 2003; Downie, Koestner, ElGeledi, & Kree, 2004) for autonomous (compared to controlled) reasons. Furthermore, group members’ meta-perception that fellow group members adhere to group norms for personally autonomous (compared to controlled) reasons is associated with themselves experiencing greater personal autonomy and well-being (Thomas, Amiot, Louis, & Goddard, 2017). More broadly, there is evidence that intragroup contexts that value submission to authority and hierarchy tend to promote less autonomous need satisfaction amongst group members than those in which equality and democracy are valued (Chirkov et al., 2003; Downie, Koestner, & Chua, 2007). Taken together, this line of work suggests that personal autonomy issues matter within intragroup contexts.

To date, no research (to our knowledge) has examined autonomy issues at the intergroup level. Yet many social groups, such as many Indigenous groups and religious ethnic minorities, have experienced substantial restrictions, past and present, to their collective autonomy. As such,
it is important to examine the influence that restrictions to collective autonomy may have on group members’ psychological need satisfaction and well-being.

We argue that collective autonomy is distinct from other pervasive cultural factors considered by SDT. For example, a group may have the freedom to define and practice its culture in a pluralistic society (high collective autonomy), and, at the same time, be ruled by a dictatorship from within their group (low personal autonomy support from ingroup members; Berlin, 1969). Moreover, a group member may personally value and desire to practice their culture openly in public (autonomous reasons for practicing culture), yet not be permitted to do so by the regulations set by other groups (lack of collective autonomy). Thus, we contend that the pervasive social environment outlined by SDT must also include the intergroup environment, within which groups may enjoy or lack collective autonomy to varying degrees. Importantly, based on the SDT framework, we hypothesized that perceived restrictions to collective autonomy should have deleterious consequences for the personal autonomy and well-being of group members. In fact, the idea that collective autonomy restrictive intergroup contexts undermine personal autonomy is consistent with social identity theory (SIT; Tajfel & Turner, 1979; 1986). SIT posits that people derive part of who they are (their self-concept, or personal identity) from the broad set of cultural values, norms, customs, and goals associated with their group (social) identity (see also Greenaway et al., 2015; Oyserman, 2007; Taylor, 1997; 2002). In intergroup contexts, collective autonomy can be restricted when ingroup members feel that other groups have attempted to control and undermine the extent to which their ingroup members are free to engage in this natural process of defining their social identity. Consistent with SDT’s proposition that individuals experience reduced personal autonomy when they feel that other individuals have personally attempted to control them (see Ryan & Deci, 2017 for review), we argue that
such intergroup experiences of collective autonomy restriction by other groups will also thwart group members’ personal autonomy. Thus, because social identity shapes personal identity and provides a template for normative behavior, group members may internalize restrictions that are placed on their ingroup by other groups, as restrictions that are also placed on themselves personally. Speaking to this idea, Mandela describes a link between the lack of autonomy that Black South Africans felt as a people during Apartheid, and the lack of personal autonomy he himself felt: for Mandela, the chains on all of his people were the same chains on him (Mandela, 1995).

**Collective Autonomy Restrictive Environments Reduce Psychological Well-Being**

Given that personal autonomy has been shown to be a consistently strong predictor of psychological well-being (Ryan & Deci, 2017), restrictions to collective autonomy should negatively impact psychological well-being by undermining group members’ personal autonomy. By considering the relation between collective autonomy and psychological well-being, the present research expands on a growing body of work that has shown a positive association between membership in social groups and psychological well-being (see Haslam, Jetten, Postmes, & Haslam, 2009; Jetten et al., 2015). One important reason for this relationship is that group members can derive a sense of feeling personally in control of their environment and capable of achieving desired outcomes (i.e., perceptions of personal control, efficacy and agency) from their social groups (Greenaway et al., 2015). Indeed, people’s perception that their social group is collectively agentic, efficacious, and has control over its own outcomes promotes feeling of personal control and personal efficacy (Jugert et al., 2016), and thus greater well-being (Tiessen, Taylor, & Kirmayer, 2009). Furthermore, because of the important role that social groups play in people’s lives, group members are sensitive to how their groups are perceived by
others. As such, perceived discrimination against one’s group has negative implications for psychological well-being (Branscombe, Schmitt, & Harvey, 1999; Sellers, Smith, Shelton, Rowley & Chavous, 1998).

An important question to be answered is whether group members can remain identified with their social group despite feeling that other groups have attempted to restrict their group’s freedom to practice elements of their culture. If they can, then collective autonomy and social identification are not synonymous. Under certain conditions, group members should remain highly identified with their group despite such restrictions. This position is congruent with research on collective action that has shown group members can remain highly identified despite injustices imposed upon them by other groups (Van Zomeren, Postmes, & Spears, 2008). Thus, independent of whether group members remain identified with their group, experiencing reduced collective autonomy should negatively impact psychological well-being by undermining personal autonomy.

The viability of the concept of collective autonomy is also contingent on differentiating it from feelings of collective efficacy, agency and control (see Greenaway et al., 2015; Tiessen et al., 2009). SDT differentiates personal control/agency/efficacy, which involves feeling able to achieve and have control over desired outcomes, from personal autonomy which involves feeling free to choose what outcomes to pursue (Deci & Ryan, 1985; Deci & Ryan, 1987; Ryan & Connell, 1989). Similarly, we argue that the same distinctions can be made at the group level: perceiving that one’s group is able to influence its environment and achieve desired outcomes (i.e., collective efficacy, agency, control) is separate from perceiving that one’s group is free to choose what outcomes to pursue, without opposition from other groups (i.e., collective autonomy). Speaking to these distinctions, although Mandela and other Black South Africans felt
that their freedom was restricted by Apartheid, they likely felt a strong sense of collective efficacy and control in terms of their group’s capacity to change their group’s plight through collective action (see Van Zomeren et al., 2008). Thus, collective autonomy should relate to psychological well-being independently of collective control, agency and efficacy.

Lastly, it is important to test that restrictions to collective autonomy reduce psychological well-being not simply because they are perceived as discrimination against one’s ingroup. We acknowledge that when group members feel that an outgroup has actively tried to threaten their group’s collective autonomy they may also feel discriminated against and disliked by that outgroup. However, restrictions to collective autonomy and discrimination are distinct: for example, an outgroup may make it clear they do not like one’s ingroup, without preventing it from determining and practicing its own culture. Alternatively, groups may impose their own customs and values on other groups, whilst explaining to the outgroup that this imposition is beneficent and beneficial for the outgroup. Thus, independently of the potentially negative effect that restrictions to collective autonomy may have on well-being through increased perceptions of discrimination, we maintain that deficits in collective autonomy would also uniquely and negatively impact well-being through reduced personal autonomy.

**Overview of Present Research**

Across four studies we tested our hypothesis that experiencing a lack of collective autonomy would undermine group members’ personal autonomy, and in turn, reduce group members’ psychological well-being. In Study 1, across three independent cross-cultural samples (combined N=622), including participants from both individualistic and collectivistic cultures, we validated a novel measure with which to assess perceived restrictions to collective autonomy. Moreover, we tested whether having restricted collective autonomy would be associated with
diminished personal autonomy and psychological well-being, beyond factors previously considered by SIT and SDT. In Study 2 (N=411) we explored the stability of perceived restrictions to collective autonomy, using a 3-wave panel design, where we verified that in general, people’s perception of collective autonomy restriction with respect to their core cultural groups should be relatively stable over time. We then examined how collective autonomy restrictions related to personal autonomy and psychological well-being over time. In Study 3 (N=255), we manipulated perceived collective autonomy restrictions with respect to one’s cultural group using a writing task and examined its direct effect on personal autonomy, and indirect effect on well-being through personal autonomy. Finally, in Study 4 (N=389), we created an engaging interactive laboratory experiment in which we systematically restricted the collective autonomy of a group and assessed the consequences of such restrictions on group members’ personal autonomy. Specifically, groups created a meaningful collective identity and subsequently, were ostensibly restricted (or not) by another outgroup from being free to act in accord with their group identity.

**Study 1**

With three culturally diverse samples (Samples 1a-1b-1c) we sought to validate a measure of group members’ subjective perception that other groups have unduly attempted to restrict their collective autonomy. Based on our overarching hypothesis, we expected that perceived restrictions to collective autonomy should relate negatively to group members’ own personal autonomy. Furthermore, we predicted that collective autonomy restrictions would have a negative indirect effect on group members’ psychological well-being by undermining their personal autonomy. To assess the robustness of these associations, we tested whether these relations would be significant when controlling for SDT constructs previously associated with
personal autonomy and psychological well-being (i.e., personal autonomy support, and personal regulatory style) and SIT constructs previously associated with psychological well-being (group identification, collective efficacy/agency/control and perceived discrimination). To be consistent with previous SDT-based research, we assessed whether our proposed effects generalize across collectivistic and individualistic cultures (Chen et al., 2015; Chirkov et al., 2003). Extending the SDT hypothesis of cross-cultural generalizability to the present research, we anticipated that the collective autonomy restrictions would have detrimental effects for personal autonomy and psychological well-being across cultures.

**Method**

This study was approved by the McGill REB-II (REB# 479-0514), under the project title: “The collective autonomy of one’s cultural group and well-being”.

In all three samples, perceived restrictions in collective autonomy were assessed with respect to the national, religious, racial and/or ethnic group that participants self-generated and considered as their “core” cultural group. A core cultural group was described to participants as “The group you refer to naturally when people ask you what your background is, and you reply ‘I am x’”. Participants indicated their core cultural group in a text box labeled “who we are”. To help participants think about a relevant intergroup context, they indicated an outgroup that was relevant to their ingroup in a text box labeled “who they are”. Participants also identified on a world map the geographical areas that they thought were most relevant to their group (see Supplementary Materials for the full surveys included in Sample 1a, Sample 1b, and Sample 1c). The name of participants’ core cultural group which was generated initially by participants was auto-populated into all further relevant scale items.
Samples

In Sample 1a, 161 Mechanical Turk workers recruited from Amazon's MTurk platform (Burhmester, Kwang, & Gosling, 2011) completed the survey. Thirty-eight participants were excluded from the analyses for incorrectly responding to one or more of the four attention check items or for not choosing an ethnic, racial, national and/or religious group as their core cultural identity. Our final sample consisted of 123 participants (63 males, 60 females, $M_{age} = 34.01, SD = 12.51$). Forty-four percent of the final sample resided in India, 44% resided in the United States and the remaining 12% resided in other countries. Across the sample, participants named 43 different cultural groups as their core cultural identity. Participants were compensated $0.75 U.S. dollars.

In Sample 1b, 198 Mechanical Turk workers recruited from Amazon's MTurk platform completed the survey. Eleven participants did not consent to have their survey responses included in the study. Fifty-eight participants were excluded from the analyses using the same criteria as used for Sample 1a or for having been already included in Sample 1a. Our final sample consisted of 129 participants (54 males, 75 females, $M_{age} = 35.12, SD = 13.14$). Forty-five percent of the final sample resided in India, 46.5% resided in the United States and the remaining 8.5% resided in various other countries. Across the sample, participants named 41 different cultural groups as their core cultural identity. Participants were compensated $0.75 U.S. dollars.

In Sample 1c, 557 workers from the crowdsourcing network Crowdflower (de Winter, Kyriakidis, Dodou, & Happee, 2015) completed the survey\(^1\). We excluded 187 participants who failed the attention checks embedded in the survey, accessed and completed the survey for a larger sample size for Sample 1c relative to Sample 1a and Sample 1b. Sample 1c was recruited through Crowdflower rather than Mechanical Turk. In our past experience, a greater number of participants miss attention checks via Crowdflower than Mechanical Turk. As such we recruited a larger sample to compensate.

\(^1\) We recruited a larger sample size for Sample 1c relative to Sample 1a and Sample 1b. Sample 1c was recruited through Crowdflower rather than Mechanical Turk. In our past experience, a greater number of participants miss attention checks via Crowdflower than Mechanical Turk. As such we recruited a larger sample to compensate.
second time, did not report a valid cultural group, or did not consent to have their data included in the final analyses. Our final sample consisted of 370 participants (233 males, 136 females, 1 not specified, $M_{age} = 34.85$, $SD = 11.83$). Thirty-eight percent of the final sample resided in India, 33% resided in the United States, 19% resided in the United Kingdom and the remaining 10% resided in various other countries. Across the sample, participants named 90 different cultural groups as their core cultural identity. Participants were compensated $1.25 U.S. dollars$.

**Materials**

Agreement with all questionnaire items was rated using a 7-point Likert scale ($1 =$ strongly disagree, $7 =$ strongly agree).

**Restrictions to Collective Autonomy.** In all three samples, group members’ perception that other groups have tried to restrict and control the identity and cultural expression of their ingroup was assessed using eight items$^3$. All eight items and corrected item-total correlations for each sub-sample and the total sample are summarized in Table 1. The inter-item reliability of the scale was high in all 3 samples (Sample 1a, $\alpha = .92$; Sample 1b, $\alpha = .92$; Sample 1c, $\alpha = .94$).

**Personal autonomy.** In all three samples, personal autonomy was measured using six items (Sample 1a, $\alpha = .71$; Sample 1b, $\alpha = .73$; Sample 1c, $\alpha = .74$) adapted from Sheldon and Gunz (2009). These items were: “I was free to do things my own way”; “My choices expressed my ‘true self’”; “I had a lot of pressures I could do without (reverse-coded)”; “There were people

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$^2$ Compensation was higher than the first two studies given that we included more scales in the survey to rule out potentially overlapping variables.

$^3$ In addition to these eight items assessing restrictions to collective autonomy we also assessed group members’ general perceptions of feeling free to determine their identity (five items), and their perception that other groups actively support their group’s autonomy (three items). Exploratory and confirmatory factor analysis confirmed that these additional items loaded onto two distinct sub-factors that were highly correlated with the restriction items (when reverse scored). Both sub-factors were also significantly related to personal autonomy and psychological well-being across the total sample, and our results remained consistent when combining these additional items with the restriction items. The total scale and three-factor structure was also invariant across people from relatively collectivistic and individualistic cultures. However, we focus on collective autonomy restriction here as this factor is most relevant to the present research question.
telling me what I had to do (reverse-coded)”; “I had to do things against my will (reverse-coded)”, and “I was really doing what interests me”.

**Ingroup autonomy support.** The extent to which people felt that their personal autonomy was supported by their fellow ingroup members was assessed in Sample 1b and Sample 1c using a 13-item scale (Sample 1b, α=.91; Sample 1c, α=.92; adapted from the personal autonomy support measure by Williams, Grow, Freedman, Ryan, & Deci 1996). A sample item is: “The people from my core cultural group who I interact with on a regular basis take the time to understand how I understand things before suggesting a new way to do things”.

**Personal regulatory style for practicing culture.** In Samples 1b and 1c, group members’ regulatory style for acting in accordance with the cultural customs and practices was measured with eight items (Sample 1b, α=.79; Sample 1c, α=.80; adapted from Chirkov et al., 2003). These items tapped (1) external reasons (reverse scored), (2) introjected reasons (reverse scored), (3) identified reasons, and (4) integrated reasons for acting in accord with the “customs and practices” and “cultural values” of their core cultural group.

**Group identification.** In all three samples, group identification was assessed using four items (Sample 1a, α=.82; Sample 1b, α=.82; Sample 1c, α=.89; adapted from Doosje, Ellemers, & Spears, 1995). A sample item is: “I identify with members of my core cultural group”.

**Collective agency.** In all three samples, group members’ perception of feeling strong, powerful and in control as a group was assessed using four items (Sample 1a, α=.92; Sample 1b, α=.91; Sample 1c, α=.93; adapted from Shnabel and Nadler's (2008) measure of personal agency). These items were: “My core cultural group has a lot of power as a group”; “My core cultural group has a lot of influence as a group”; “My core cultural group has a lot of control as a group”; “My core cultural group feels relatively strong as a group”.
Collective efficacy. In Sample 1c, collective efficacy was measured using a five-item scale ($\alpha=.82$; adapted from Gibson, Randel, & Early, 2000). The collective efficacy scale included three items assessing group members’ perception that their group can achieve desired outcomes for their group in general. A sample item is: “Members of my core cultural group can do anything they really set their minds to”. The scale also included two items that assessed collective efficacy with respect to specific group practices. A sample item is: “Members of my core cultural group know what is involved for practicing their cultural customs”.

Internal locus of collective control. In sample 1c, we assessed group members’ perception of collective control in terms of their belief that the positive and negative outcomes that happen to their group are a result of their group, rather than external forces. This was assessed using an eight-item scale ($\alpha=.69$) developed by Tiessen, Taylor and Kirmayer (2009). A sample item is: “The good things that happen to people in my core cultural group are due to their own effort”.

Perceived discrimination. In Sample 1c, general perceptions of discrimination were assessed with three items ($\alpha=.69$). These items were: “It is common that members from other groups discriminate against members of my group”; “My core cultural group has been the target of prejudice”; and “It is rare that members of my core cultural group face discrimination”.

Psychological well-being. We included three measures of psychological well-being: Diener’s life satisfaction scale (Diener, Emmons, Larsen, & Griffin, 1985; Sample 1a, $\alpha=.90$; Sample 1b, $\alpha=.92$; Sample 1c, $\alpha=.90$); the short index of self-actualization (Jones & Crandall, 1986; Sample 1a, $\alpha=.62$; Sample 1b, $\alpha=.68$; Sample 1c, $\alpha=.68$); Rosenberg’s self-esteem scale (Rosenberg, 1965; Sample 1a, $\alpha=.88$; Sample 1b, $\alpha=.89$, Sample 1c, $\alpha=.88$). In addition, we included one clinical measure of ill-being: the Centre for Epidemiological Studies Depression
Inventory (Radloff, 1977; Sample 1a, α=.81; Sample 1b, α=.83; Sample 1c, α=.84). We selected these four indices as they have been validated across collectivistic and individualistic cultures and have been related to personal autonomy across cultures (Chirkov et al., 2003). Consistent with past research, a composite score was computed from the mean of the standardized scores of the three well-being outcomes and the standardized reversed score of the ill-being measure (Sample 1a, α=.74; Sample 1b, α=.78; Sample 1c, α=.75). The results reported in the main text using the composite well-being score remained consistent when analyzing clinical depression and the three well-being measures separately (See Supplemental Analyses 3).

Collectivistic/individualistic values of home culture. Participants were assigned an individualism index value (IDV) based on their country of citizenship whereby higher values indicated a more individualistic culture. Scores were based on Hofstede’s extended list of IDVs for 76 countries obtained through extensive mass-surveying of the individualistic and collectivistic values of IBM employees (see Hofstede, Hofstede, & Minkov, 2010). Hofstede’s measure has been generalized outside of the organizational domains and correlates highly with other indices of collectivistic versus individualistic values (e.g., Schwartz 1999, 2006). When participants did not reside in one of the countries listed by Hofstede, we assigned an IDV based on the average IDVs of its neighboring countries (see Schwartz 1999 and Downie et al., 2007 for similar approaches). We examined whether participants’ IDV score based on their country of citizenship moderated the impact of perceived collective autonomy restrictions on personal autonomy and psychological well-being.

Results and Discussion
**Preliminary analyses.** Using data from the combined samples we examined the factor structure of the collective autonomy restriction scale utilizing a two-phase procedure recommended by Thompson (2004; see also Bryant & Yarnold, 1995). First, exploratory factor analysis (EFA) was conducted on half the sample (n=311) selected at random using maximum likelihood and Oblimin rotation (Jolliffe, 2002). As predicted, EFA revealed a single-factor solution representing people’s perception that their group was restricted and controlled by other groups, (Eigenvalue= 5.58, variance explained = 69.72). Next, confirmatory factor analysis (CFA; Byrne, 1994) was conducted on the other randomly selected half of the sample using Lavaan (Rosseel, 2012). We examined the fit of a model with the eight items loading onto a single factor (See Figure 1). The model had acceptable model fit indices: comparative fit index (CFI)=.98, standard root mean square intervals (SRMR)=.03, root mean square error Approximation (RMSEA)=.08, 90% CI [.06, .11], $BIC=8225.20$, $\chi^2 =59.65$ (Hu & Bentler, 1999; Byrne, 1994; Steiger, 1990) and no negative error variances or improper solutions. We compared the one-factor model to a model with two sets of four items randomly selected to load onto two factors ($CFI=.98$, $SRMR=.03$, $RMSEA=.08$, 90% CI [.06,.11], $BIC=8229.67$, $\chi^2 =58.43$). The 2-factor model did not provide better model fit, $\Delta BIC=4.47$, $\Delta \chi^2 =-1.22$, $p=.27$, and thus the more parsimonious single factor solution was retained (Byrne, 1994).

In a second CFA, we ensured that the items assessing collective autonomy restrictions and the items assessing personal autonomy represented two distinct constructs as predicted. In accord with previous SDT research, we expected personal autonomy to be composed of two sub-factors: personal autonomy need satisfaction (i.e., positively scored items) and personal autonomy need frustration (i.e., reverse-scored items; see Chen et al., 2015). Thus, we tested a model consisting of three first-order latent factors (collective autonomy restrictions, personal
autonomy need satisfaction, and personal autonomy need thwarting). This proposed model fit the data well, $CFI=.96$, $SRMR=.04$, $RMSEA=.06$, 90% CI[.04, .07], $BIC=14009.40$, $\chi^2=144.64$ and there were no negative error variances or improper solutions within the model. We compared this model to a 2-factor model in which the collective autonomy restriction items were combined on a single factor with the personal autonomy need-frustration items, $CFI=.90$, $SRMR=.09$, $RMSEA=.10$, 90% CI[.09, .11], $BIC=14135.90$, $\chi^2=282.45$. Thus, the model distinguishing collective autonomy restrictions from personal autonomy provided a significantly better fit for the data, $\Delta BIC=126.50$, $\Delta \chi^2=137.8$, $p<.001$. Together these results indicate that our collective autonomy restriction items factored onto a single latent construct as hypothesized that is distinct from personal autonomy$^4$.

**Main analyses.** Descriptive statistics and Pearson’s correlations for each sub-study are presented in Tables 2-4. As expected, in each sample, collective autonomy was robustly associated with personal autonomy and psychological well-being.

**Direct effect on personal autonomy.** We next conducted multiple linear regression with each sample to test whether restrictions to collective autonomy uniquely related to personal autonomy, beyond potentially overlapping constructs from SDT and SIT. In each analysis, we entered the potentially overlapping variables into the first step of the regression model, and perceived restrictions to collective autonomy into the second step of the model (Table 5)$^5$. As hypothesized, restrictions to collective autonomy related to unique variance in personal

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$^4$ To ensure the collective autonomy restriction scale was invariant across collectivistic and individualistic cultures we assessed the presence of strong (scalar) invariance using multi-group confirmatory analysis (Cheung & Rensvold, 2002; Meredith, 1993). To have optimal statistical power for this analysis (n>400 per group, Meade, 2005) we combined the total sample of Study 1 with the sample utilized in Study 3, which also included participants from collectivistic and individualistic countries and conducted the invariance analysis. As indicated in Supplemental Analysis 1 we found evidence of strong invariance across individualistic and collectivistic cultures.

$^5$ Supplemental Analysis 2 summarizes the complete results of regressing well-being onto collective autonomy restriction and potentially overlapping factors.
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autonomy, in Sample 1a, $R^2_{\text{change}}=.19$, $F_{\text{change}}(1,119)=31.09$, $p<.001$, Sample 1b, $R^2_{\text{change}}=.05$, $F_{\text{change}}(1,122)=7.64$, $p=.007$, and Sample 1c, $R^2_{\text{change}}=.04$, $F_{\text{change}}(1,359)=16.41$, $p<.001$, after controlling for personal autonomy support, personal regulatory style, group identification, collective agency/efficacy/control and/or discrimination. Thus, together these results provide consistent initial support that restrictions to collective autonomy might be associated with diminished personal autonomy independently of other constructs previously considered within SDT and SIT.

**Indirect effect on psychological well-being.** Using the PROCESS macro for SPSS (Hayes, 2013; Model 4, 5,000 boot-strapping samples) we tested whether restrictions to collective autonomy are indirectly associated with reduced psychological well-being because of their negative relation with personal autonomy. As covariates in the model we controlled for potentially overlapping SDT and SIT variables previously associated with well-being. As predicted, in each sample perceiving that the collective autonomy of one’s core cultural group was unduly restricted had a significant negative indirect association with psychological well-being through personal autonomy. Total, direct and indirect effects are summarized in Table 6. Together, these findings provide consistent initial evidence that restrictions to collective autonomy might have a unique indirect and negative association with psychological well-being, when accounting for other factors previously associated with well-being within SDT and SIT.

**Cross-Cultural Generalizability.** Across the total sample, moderated mediation analysis using PROCESS (Model 7; 5,000 boot-strapping samples) found that the direct effect of collective autonomy restrictions on personal autonomy was not moderated by the IDV score of participants’ country of citizenship, $B=-.001$, $SE=.001$, $p=.43$, 95% CI[-.003, .001]. Collective

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6 We repeated the key analyses for Study 1 when including participants who failed the attention checks. The significance of our results did not change (see Supplemental Analysis 6).
autonomy restrictions were related to reduced personal autonomy amongst individuals from relatively collectivistic countries (-1SD), $B=-.20$, $SE=.04$, $p<.001$, 95% CI[-.27, -.13], and relatively individualistic countries (+1SD), $B=-.24$, $SE=.03$, $p<.001$, 95% CI[-.31, -.17]. Similarly, the index of moderated mediation was non-significant, $IMM=-.0003$, $SE=.0004$, 95% CI[-.001, .001] indicating that collective autonomy restrictions had a significant negative indirect association with well-being through personal autonomy amongst people from relatively collectivistic countries (-1SD), $Indirect\ Effect=-.07$, $SE=.01$, 95% CI[-.10, -.04], and relatively individualistic countries (+1SD), $Indirect\ Effect=-.09$, $SE=.01$, 95% CI[-.11, -.06]. When performing moderated mediation analysis with each sub-sample separately we found no significant moderation effects in any of the sub-samples (See supplemental analysis 4).

Taken together these results indicate that the negative consequences that restrictions to collective autonomy may pose for group members’ personal autonomy and psychological well-being generalize across collectivistic and individualistic cultures.

**Study 2**

Study 1 provided initial cross-sectional evidence that feeling that one’s collective autonomy has been restricted by other groups is associated with diminished personal autonomy and psychological well-being. Building on these results, in Study 2, we employed a three-wave panel design to assess how university students’ perceptions of collective autonomy restrictions would relate to their personal autonomy and psychological well-being over the course of a four-month Fall semester. This allowed us to explore the relative stability of people’s perceptions of

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7 To gain further confidence in our results we sought to internally replicate our key findings when repeating our analyses separately with people from India, the United States, and dividing the remaining participants into two groups based on their IDV scores (See supplemental Analysis 5). We found consistent results across all sub-groups, with the effects being significant amongst the Indian and American sub-samples that had adequate statistical power. As well, our key findings remained consistent when using a multi-level model that treated participants’ country of citizenship as a random variable and thus accounted for potential non-independence among participants nested within the same country (Raudenbush & Bryk, 2002; See Supplemental Analysis 7).
collective autonomy restrictions. Barring major intergroup events that could alter the collective autonomy of a group (e.g., a newly implemented law restricting members of certain groups from engaging in a specific cultural custom), we expected that on average, group members’ general perception of collective autonomy restrictions would be relatively stable over the four-month period.

The repeated-measures design used in Study 2 also allowed us to differentiate between the potential between-person (trait) level, and within-person (state) level effects of perceived collective autonomy restrictions on personal autonomy and psychological well-being. It is important to do so because perceptions about one’s group (i.e., collective autonomy restrictions) tend to be construed at a higher level of abstraction than perceptions pertaining to one’s self (i.e., personal autonomy; see McCrea, Wieber, & Myers, 2012; Turner et al., 1987). Perceptions that occur at higher (more abstract) levels of construal are less impacted by situation-specific factors than perceptions which occur at lower (more concrete) levels of construal (Trope & Liberman, 2010). On this basis, we did not expect people to be sensitive to specific within-person fluctuations in collective autonomy restrictions—a relatively abstract, high-level perception. Consequently, we expected a significant between-person “trait”-level effect of collective autonomy on psychological well-being and personal autonomy, but not necessarily significant within-person level effects. Consistent with SDT, we did expect that people’s well-being would be sensitive to within-person fluctuations in personal autonomy, as personal perceptions of autonomy should be experienced at a more concrete and situation-specific level of construal than perceptions of collective autonomy. Thus, we expected both within-person and between-person level effects of personal autonomy on psychological well-being.

Method and Sample
This study was approved by the McGill REB-II (REB# 146-0915), under the project title: “Examination of the Role of Autonomy, Internalization, and Interpersonal Support in Goal Pursuits”.

Five-hundred and eight university students were recruited for a six-wave year-long study focusing on psychological need-satisfaction and students’ goal progress during the school year. We measured collective autonomy during the first three assessment periods conducted at the beginning, middle and end of the fall semester. Each assessment period was spaced approximately six weeks apart. Participants were compensated $50 CAD for their participation. Seventy-seven participants failed to complete the collective autonomy scale at all three time-points. A further 20 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 411 students (340 female, 68 male, 3 other; M_{age}=21.22, SD=4.11). Across the sample, participants named 181 different cultural groups as their core cultural identity.

**Measures**

**Collective Autonomy.** Because the follow-up surveys needed to be brief, we used two items to assess group members’ perception that other groups attempted to restrict the collective autonomy of their group: “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). The two items were highly inter-correlated at all three time points ($r_{T1}=.76; r_{T2}=.75; r_{T3}=.81$). Indicative of measurement stability we found participants’ scores to be highly inter-correlated (mean inter-correlation=.65, all inter-correlations significant, $p<.001$)\(^8\).

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\(^8\) We also assessed group members’ general perceptions of feeling free to determine their identity (two items), and their perception that other groups actively support their group’s autonomy (two items). Our results did not change when including these items in the scale.
Personal autonomy. Consistent with Study 1, personal autonomy felt during the last week was assessed using six items (Sheldon & Gunz, 2009; $\alpha_{T1}=.57$, $\alpha_{T2}=.64$, $\alpha_{T3}=.64$). Participants’ personal autonomy scores were also significantly correlated over time (mean inter-correlation=.51, all $ps < .001$).

Psychological well-being. Psychological well-being was assessed with Diener’s life satisfaction scale ($\alpha_{T1}=.88$, $\alpha_{T2}=.89$, $\alpha_{T3}=.90$), and 5 items assessing people’s positive affect ($\alpha_{T1}=.78$, $\alpha_{T2}=.84$, $\alpha_{T3}=.89$) and 7 items assessing negative affect (reverse scored; $\alpha_{T1}=.83$, $\alpha_{T2}=.86$, $\alpha_{T3}=.85$) selected from the PANAS (Watson & Clark, 1999). At each time point, we computed a composite well-being score by taking the mean of the standardized score for each index ($\alpha_{T1}=.51$, $\alpha_{T2}=.61$, $\alpha_{T2}=.62$). Participants’ psychological well-being scores were significantly correlated over the three time-points (mean inter-correlation =.59, all $ps < .001$).

Multi-Level Analysis Strategy

Participants’ repeated responses over time were nested within person. Thus, we used a multilevel linear modeling strategy (Hayes, 2006; Raudenbush & Bryk, 2002) to account for the non-independence of participants’ responses and to assess the between- and within-person effect of perceived collective autonomy restrictions (level 1) on personal autonomy (level 1), and the between- and within-person indirect effect of collective autonomy restrictions on psychological well-being (level 1) through personal autonomy. We used Bauer, Preacher, and Gil’s (2006) approach for disentangling within- and between-person effects and assessing mediation within a 1-1-1 multi-level model. Within-person effects were assessed on the basis of person-centered scores of the independent variable (i.e., collective autonomy restrictions) and mediator variable (i.e., personal autonomy). Between-person effects were assessed on the basis of the person-level mean for the independent and mediator variables. A Monte-Carlo simulation was used to assess
the indirect effect (Bauer et al., 2006). These analyses were run in SPSS utilizing the MLmed macro (Rockwood & Hayes, 2017) designed specifically for computing such analyses. We included time as a level 1 covariate in the model. Preliminary 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 7. As would be expected the intraclass correlation coefficient (ICC) for collective autonomy (ICC=.58, 95% CI [.57, .58]), personal autonomy (ICC=.50, 95% CI [.49, .51]), and psychological well-being (ICC=.54, 95% CI [.54, .55]) were large, indicating that participants’ own responses were strongly non-independent.

To assess the effect of collective autonomy simultaneously on personal autonomy, we regressed personal autonomy on time⁹ (level 1), person-centered collective autonomy restrictions (level 1), and person-mean collective autonomy restrictions (level 2). As hypothesized, there was a significant negative between-person effect of collective autonomy restrictions on personal autonomy, \( \gamma = -0.08, SE = 0.02, 95\% \text{ CI} [-0.12, -0.03], t(409) = -3.35, p < .001 \). In other words, people who tended to generally perceive their group as having its collective autonomy restricted tended to also experience reduced personal autonomy over the four-month period. In contrast, there was no significant within-person effect of collective autonomy on personal autonomy, \( \gamma = 0.03, SE = 0.02, 95\% \text{ CI} [-0.01, 0.07], t(820) = 1.31, p = .19 \). Time had a significant effect on personal autonomy such that personal autonomy decreased over the course of the semester, \( \gamma = -0.09, SE = 0.02, 95\% \text{ CI} [-0.14, -0.05], t(820) = -4.16, p < .001 \).

⁹ 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.
To assess the total effect of collective autonomy restrictions on psychological well-being, we regressed psychological well-being simultaneously on time, person-centered collective autonomy restrictions, and person-mean collective autonomy restrictions. There was a significant negative effect of collective autonomy restrictions on psychological well-being at the between-person level, $\gamma = -.05, SE = .02, 95\% \text{ CI} [-.09, -.01], t(409) = -2.52, p = .01$. The within-person effect of collective autonomy on psychological well-being was non-significant, $\gamma = -.01, SE = .02, 95\% \text{ CI} [-.04, .02], t(820) = -.82, p = .41$. Time did not have a significant effect on well-being, $\gamma = -.003, SE = .02, 95\% \text{ CI} [-.04, -.03], t(820) = -.18, p = .86$.

To assess the direct and indirect effect of collective autonomy restrictions on psychological well-being, we regressed well-being simultaneously on time, person-centered collective autonomy restrictions, person-mean collective autonomy restrictions, person-centered personal autonomy, and person-mean personal autonomy. Consistent with previous SDT-based research, personal autonomy had a significant within-person level effect, $\gamma = .30, SE = .02, 95\% \text{ CI} [.26, .35], t(819) = 12.91, p < .001$, and between-person effect, $\gamma = .49, SE = .03, 95\% \text{ CI} [.42, .55], t(408) = 14.73, p < .001$, on psychological well-being.

Indicative of mediation, the direct between-person effect of collective autonomy restrictions on psychological well-being was non-significant, $\gamma = -.01, SE = .02, 95\% \text{ CI} [-.04, .02], t(408) = -.66, p = .51$. Importantly, supporting our mediation hypothesis, there was a significant between-person indirect effect of collective autonomy on psychological well-being through personal autonomy, $\gamma = -.04, SE = .01, 95\% \text{ Monte-Carlo CI} [-.06, -.02]$. In other words, people who tended to feel that the collective autonomy of their group was restricted tended to experience less psychological well-being as a result of generally experiencing less personal
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autonomy. The indirect effect was non-significant at the within-person level, $\gamma = .01, SE = .01$, 95% Monte-Carlo CI [-.004, .02].

Discussion

Study 2 replicated and extended the results observed in Study 1 using a longitudinal design assessing collective autonomy at three time-points. Group members who tended to feel that their group’s autonomy to freely define and express its identity had been restricted by other groups also tended to experience less personal autonomy over the four-month period. In turn, experiencing restrictions to collective autonomy related to group members experiencing less psychological well-being over the four-month span of time—an effect mediated by participants experiencing reduced personal autonomy.

Of note, the negative effects of collective autonomy restrictions were observed at the between-person (trait) level, but not at the within-person level. The lack of within-person level (situation-specific) effects of collective autonomy restrictions on personal autonomy and well-being is consistent with construal level theory research, which has shown that perceptions that occur at a higher level of abstraction are less situation-specific (Trope & Liberman, 2010). Given that group-level perceptions are construed at a high level (McCrea et al., 2012; Turner et al., 1987), we expected and found that perceptions of collective autonomy are less impacted by situation-specific events, and thus fluctuate less within person across time points. In contrast, personal autonomy, which occurs at a lower level of abstraction than perceptions of collective autonomy, was found to be more situation-specific and impacted psychological well-being both at the within- and between-person level.

A potential limitation of Study 2 was that we used a shortened two-item scale to assess collective autonomy restrictions. However, scale brevity can also be desirable as it reduces
participant demands and allows the scale to be used in more intensive research designs (Clark & Watson, 1995; Robins, Hendin, & Trzeniewski, 2001). Given the high reliability and stability of the shortened scale, and that our results were consistent with our hypotheses, Study 2 provides some validation for this shortened 2-item scale.

The results of Study 2, however, do not stand on their own. To gain further confidence in these results, we conducted an additional three-wave longitudinal study with a sample of 139 American MTurk workers (see Supplemental Study 1). Once again, we used the shortened 2-item scale of collective autonomy restrictions, which was assessed at Time 1 in relation to participants’ core cultural group. Personal autonomy and psychological well-being were assessed at all three time-points spaced six weeks apart. Consistent with the results of Study 2, a 2-1-1 multilevel analysis\textsuperscript{10} found a significant between-person (trait level) effect of collective autonomy restrictions measured at Time 1 on group members’ psychological well-being across the three time points. As found in Study 2, this effect was mediated through personal autonomy.

**Study 3**

Studies 1 and 2 provide initial correlational evidence that group members may experience reduced personal autonomy and psychological well-being when they feel that the collective autonomy of their cultural, racial, ethnic or religious group has been restricted by other groups in society. Building on these initial studies, Study 3 sought to experimentally manipulate the extent to which group members from different collectivistic and individualistic countries felt that the collective autonomy of their core cultural group had been restricted.

For obvious reasons, it is not possible to restrict the collective autonomy of an entire real-world cultural group. Thus, we used a narrative writing manipulation (e.g., Usborne & Taylor,\textsuperscript{10} Rather than testing a 1-1-1-mediation model as in Study 2, we tested a 2-1-1 model as we only assessed collective autonomy restriction at time 1 and thus used this as a trait (level 2) predictor.)
2012) to (temporarily) induce group members to feel that their group either had or lacked collective autonomy during its history. We hypothesized that having group members recall a time in which their group’s autonomy was restricted (rather than supported) by other groups in society would momentarily reduce their perception that they have personal autonomy in their daily lives. In turn, as a result of reducing group members’ personal autonomy, we hypothesized that this manipulation would also reduce their psychological well-being.

We also sought to ensure that priming restrictions to collective autonomy would impact group members independently of psychological processes previously associated with personal autonomy or psychological well-being within SDT (personal autonomy support, personal regulatory style) and SIT (discrimination, group identification, collective agency). Thus, we also assessed these other constructs following our manipulation in order to rule out the possibility that they were impacted by the collective autonomy manipulation.

Lastly, we again assessed the cross-cultural generalizability of these results by sampling people from relatively individualistic and collectivistic countries.

Method

This study was approved by the McGill REB-II (REB# 479-0514), under the same project as Study 1.

Participants. Four hundred and sixty-seven participants\(^{11}\) were recruited for the study using two crowdsourcing networks: Crowdflower (n=331) and MTurk (n=136). Participants

\(^{11}\) In Study 3, we included a third condition in which participants were asked to describe the customs, practices, and values of their core cultural group in general. Although the survey was programmed to randomly assign participants to one of the three conditions, distribution was unbalanced, such that substantially more participants were assigned to this third condition relative to the two experimental conditions (N\(_{\text{total}}\)=372, N\(_{\text{Final}}\)=252, 68% included). We initially considered the task of describing one’s culture in general as a neutral task with respect to issues of collective autonomy. However, upon reading participants' responses we found that some participants wrote about intergroup situations involving their group either having or lacking collective autonomy. Given unequal sample size of this condition relative to the other conditions, and the lack of clarity as to whether this condition was indeed
were randomly assigned to either describe a time when their core cultural group lacked collective autonomy (collective autonomy restriction condition, n=225) or had collective autonomy (collective autonomy condition, n=242). One-hundred and ninety-four participants were excluded for one or more of the following reasons: failing to select a national, ethnic, religious, or racial group as their core cultural group (N=32), failing to pass one or more attention checks imbedded within the scales assessing the key study outcomes assessed¹² (n=121), completing the present survey multiple times (N=15), having completed one of our previous studies on collective autonomy (N=22), failing to complete the writing task, copying and pasting a response from the Internet rather than formulating their own response (N=44), and/or for failing to agree to have their data included in the study (N=56). We also excluded seven participants who had missing data for one of the key outcomes (i.e., collective autonomy, personal autonomy, psychological well-being). A total of 255 participants remained (males=149, females=106; Mage=32.96, SD=10.61). The percentage of participants by condition who passed our inclusion criteria is as follows: collective autonomy restriction condition=120, 53% included; collective autonomy condition=135, 56% included. Attrition was independent of the condition to which participants were assigned, \(X^2(1)=.23, p=.63\). The final sample is distributed as follows: 31.4% of the final sample resided in the United States, 32.2% resided in India, 9.8% in the Philippines, and 25.9% resided in other countries.

**Procedure.** Participants first completed the preliminary exercise utilized in Study 1 to identify their core cultural group and the intergroup context most relevant to their group. Across neutral with respect to collective autonomy, we excluded participants in this condition from our main analyses. Supplemental Analysis 8 replicates the main analyses when including all three conditions.

¹² We included a fourth attention check at the end of the survey, following additional variables which were included for supplemental and exploratory analyses (See Supplemental Materials for full questionnaire). However, exclusion was based solely on the three attention checks imbedded in the primary component of the survey, as the fourth was part of a battery of questions whose results are beyond the scope of the present research. To gain further confidence in our results we repeated our primary analyses when including participants who missed the three key attention checks. Our results did not change significantly when including these participants (See Supplemental Analysis 9).
the sample, participants named 86 different cultural groups as their core cultural identity.

Participants then completed the writing task, and then the remainder of the survey. All participants first received a brief definition and description of what collective autonomy entails (See Supplemental Materials for a detailed description).

Participants in the collective autonomy condition were given the following instructions:

*In a detailed paragraph describe one way in which your core cultural group has been free to determine its own cultural identity. For example, this can involve ways in which your group has been free to determine its identity as a group: your own shared values, customs and practices. Or it can involve other groups respecting the right that members of your group have to follow your own cultural customs and practices.*

Participants in the collective autonomy restriction condition were given the following instructions:

*In a detailed paragraph describe one way in which your core cultural group has NOT been free to determine its own cultural identity. For example, this can involve another group unduly influencing the identity of your group: your own shared values, customs and practices of your group. Or it can involve other groups disrespecting the right that members of your group have to follow your own cultural customs and practices.*

**Materials**

After completing the writing task, participants completed a larger questionnaire (see Supplemental Materials for full survey), which included the scales assessing the key outcomes of the study:
Collective autonomy restrictions: Group members’ perception that their collective autonomy had been unduly restricted by other groups was assessed using the same eight-item scale used in Study 1 (α=.92).

Personal autonomy. Personal autonomy felt during the last week was assessed as in Study 1 (α=.75).

Psychological well-being. As in Study 1 we assessed psychological well-being using: Diener’s life satisfaction scale (Diener, Emmons, Larsen, & Griffin, 1985; α=.89); the short index of self-actualization (Jones & Crandall, 1986; α=.64); Rosenberg’s self-esteem scale (Rosenberg, 1965; α=.89); and the Centre for Epidemiological Studies Depression Inventory (Radloff, 1977; α=.82). An overall score of psychological well-being was computed by taking the mean of the standardized scores of each individual measure (α=.80). Our results remained consistent when using a composite of the three well-being measures and the clinical measure of depression separately in our analyses (See Supplemental Analysis 10).

Potentially overlapping variables. Feelings of collective agency (α=.92), perceived discrimination (α=.70), personal regulatory style (α=.77), and personal autonomy support from other group members (α=.90) and group identification (α=.90) were assessed using the same scales utilized in Study 1.

Collectivistic/individualistic values of home culture. As in Study 1, we assigned participants an individualism index value (IDV; Hofstede et al., 2010) based on their country of citizenship and examined if this score moderated the effects of condition on personal autonomy and psychological well-being.\(^\text{13}\)

\(^{13}\) As in Study 1, we repeated the main-text analyses utilizing a multi-level model which accounted for the potential non-independence between participants nested within country. Our results were identical to what was found using the GLM which we report in the main text (See Supplemental Analysis 11).
Results

Descriptive statistics of the key study outcomes and correlations collapsing across the collective autonomy restriction and collective autonomy conditions are presented in Table 8.

Manipulation check. One-way analysis of variance (ANOVA) revealed a significant main effect of writing condition on participants’ perception that other groups have attempted to restrict the collective autonomy of their ingroup, $F(1,253)=10.47, p<.001, \eta^2=.04$. As expected, participants who described a time in their group’s history in which their group had its collective autonomy restricted by other groups reported significantly higher levels of collective autonomy restriction ($M=4.93, SD=1.53$) relative to group members who described a time in their group’s history in which their group enjoyed collective autonomy ($M=4.32, SD=1.51$). These results indicate that our writing manipulation was effective in inducing participants to momentarily feel that their group’s collective autonomy had been restricted by other groups.

Personal autonomy. One-way analysis of variance revealed some evidence of a significant effect of writing condition on participants’ subjective feelings of personal autonomy, $F(1,253)=3.74 p=.054, \eta^2=.02$. Supporting our hypothesis, participants in the collective autonomy restriction condition reported lower personal autonomy ($M=4.71, SD=1.19$) relative to participants in the collective autonomy condition ($M=4.99, SD=1.07$).

Psychological well-being. One-way ANOVA revealed no significant main effect of condition on psychological well-being, $F(1,253)=2.78, p=.10, \eta^2 =.01$, although the results trended in the expected direction. Participants in the collective autonomy restriction condition ($M=-.09, SD=.78$) reported less well-being relative to participants in the collective autonomy condition ($M=.08, SD=.79$). Even though the direct effect of writing condition on psychological

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14 We note that the $p$ value (.054) is on the threshold of significance (.05) when rounding to the 100th decimal. Results are below the $p < .05$ threshold ($p =.02$) when increasing our sample size and statistical power by including participants who failed the attention checks embedded in the survey (See Supplemental Analysis 9).
well-being was non-significant, Kenny and Judd (2014) argue that the power to detect a direct effect can be dramatically smaller than the power for the test of the indirect effect. This occurs when the central research question is whether a randomized intervention is efficacious in impacting an outcome variable, and there is a theoretical rationale as to the mechanism through which the intervention may impact that outcome. Under such conditions, there is benefit in testing \( ab \) (the indirect effect) over \( c \) (the direct effect). Such a condition applies to the present research, in that we expected the writing manipulation would impact psychological well-being indirectly as a result of its direct impact on personal autonomy. As such, we performed a mediation analysis with PROCESS (Hayes, 2013; model #4) using 5,000 bootstrapping samples, to examine if condition had a significant indirect effect on psychological well-being through personal autonomy. Supporting this hypothesis, analyses revealed some evidence of a significant indirect effect of condition on psychological well-being through personal autonomy, \( b = .10, SE = .05, 95\% CI [.02, .21]^{15} \).

**Effect on potentially overlapping variables.** As expected, we did not find any significant effect of condition on group identification, collective agency, personal regulatory style, or perceived personal autonomy support from other members within one’s ingroup (See Table 9). We did, however, find a significant effect of condition on discrimination, but this effect was not significant when controlling for participants’ perceptions of collective autonomy. Taken together, these analyses indicate that our manipulation of collective autonomy restrictions did not have any unique effect on the potentially overlapping variables when accounting for its impact on perceived restrictions to collective autonomy.

\(^{15}\text{We note that the lower bound of the bootstrapping confidence interval is on the threshold of including "0". The indirect effect does not include zero (Indirect effect = .10, 95\% CI [.02, .20]) when increasing our sample size and statistical power by including participants who failed the attention checks embedded in the survey (See Supplemental Analysis 9).}\)
**Cross-cultural generalizability.** Consistent with Study 1, moderated mediation analysis revealed that the relation between perceived restrictions to collective autonomy (i.e., the manipulation check) and personal autonomy was not significantly moderated by the IDV score of one’s country of citizenship, $B=.04$, $SE=.03$, $p=.14$, 95% CI[-.01, .10]. Moreover, the indirect effect of perceived restrictions to collective autonomy on well-being was not moderated by culture, $IMM=-.0004$, $SE=.001$, 95% CI[-.002, .001].

Simple slope analysis indicated that perceived collective autonomy restrictions impacted personal autonomy directly and impacted well-being indirectly amongst people from countries with a relatively individualistic IDV score ($SD=1$), and relatively collectivistic IDV score ($SD=-1$). We found some evidence of a significant interaction between condition and culture on personal autonomy, $B=.01$, $SE=.01$, $p=.054$, 95% CI[.00, .02], although the index of moderated mediation was non-significant, $IMM=.004$, $SE=.002$, 95% CI[.00, .009]. Closer examination of the simple slopes indicated that condition had a significant effect on personal autonomy, and a significant indirect effect on psychological well-being for people from countries with relatively individualistic IDV scores ($SD=1$), and moderate IDV scores ($SD=0$), but not relatively collectivistic IDV scores ($SD=-1$). Simple slopes are summarized in Table 10.

**Discussion**

Study 3 provided experimental support for our general hypothesis that restrictions to collective autonomy undermine personal autonomy, and in turn reduce psychological well-being. When group members were manipulated to describe an intergroup context in which their collective autonomy was restricted (compared to an intergroup context in which they enjoyed collective autonomy) they reported feeling less *personal* autonomy. Furthermore, describing events in which one’s group lacked collective autonomy had negative downstream consequences
for psychological well-being, as a consequence of its effects on personal autonomy. Results also provided additional evidence to support our contention that collective autonomy is unique from other constructs previously considered within self-determination theory (i.e., group members’ reasons for practicing their culture and personal autonomy support from ingroup members) and social identity theory (i.e., group identification, collective agency, and general perceptions of discrimination).

Consistent with Study 1, perceived restrictions to collective autonomy were negatively associated with personal autonomy and psychological well-being among people residing in relatively individualistic and collectivistic countries. This provides further support for our hypothesis that perceiving restrictions to collective autonomy has detrimental effects irrespective of the extent to which people have an interdependent or independent view of themselves. Interestingly, however, the experimental effects were stronger among participants from individualistic countries (compared to collectivistic countries). Unfortunately, none of the measures collected provide an explanation for this difference. It is possible that the difference is a statistical aberration. After all, participants’ perception of collective autonomy restriction was related equally to key outcomes across both types of cultures. At present, we are hesitant to speculate about why this difference was observed. Before doing so, this effect would need to be replicated. It should also be noted that there was no main effect of the manipulation on psychological well-being. This may be because the brief writing manipulation was not as strong amongst members of relatively collectivistic cultures. As well, a substantial number of participants were excluded because they failed to pass attention checks. Importantly however, our results remained consistent when including these participants (see Supplemental Analysis 9).
Study 4

Studies 1-3 provided accumulating evidence that group members’ personal autonomy, and in turn psychological well-being, is undermined when they feel that the collective autonomy of their national, ethnic, racial, or religious group is being restricted by other social groups. However, because real groups were assessed it was not possible to manipulate collective autonomy restrictions by other groups. In Study 4, we developed an immersive laboratory context in which we could experimentally manipulate whether groups actually had the freedom to determine and act in accordance with their culture.

In a collective autonomy restriction condition, participants were exposed to a situation in which an outgroup acted on its power to restrict their group’s collective autonomy. This context was tested against a collective autonomy support condition. In this condition, an outgroup did not act on its power to restrict the participant’s group’s collective autonomy. We also included a control condition in which the outgroup could never restrict the ingroup’s collective autonomy. We hypothesized that members of groups that had their collective autonomy restricted would experience less personal autonomy during the experiment than group members in the support and control conditions. We did not anticipate differences between the support and control conditions, as groups did not experience collective autonomy restrictions in either condition. Additionally, we assessed how satisfied group members were when behaving in accordance with their own chosen culture, as opposed to being forced to act in accordance with an altered version of their culture that was forced upon them by another group. Thus, we were able to test the basic assumption that group members prefer acting in accord with a culture that they autonomously developed, rather than a culture that was externally imposed upon their group.
Study 4 also aimed to further differentiate collective autonomy from perceptions of group identification and collective control/efficacy/agency considered by previous work by Greenaway and colleagues (2015) and Jugert and colleagues (2016). Specifically, we did not anticipate that restrictions to collective autonomy to have a significant impact on group identification or group member’s feelings of collective agency. Moreover, we did not expect that restrictions to collective autonomy would necessarily reduce group members’ personal sense of competence (efficacy) during the experiment. If collective autonomy restriction does not impact personal competence, the present work can be differentiated from Jugert and colleagues’ (2016) findings that manipulating collective efficacy and control at the group level impacts personal efficacy or competence at the personal level.

Lastly, to further differentiate collective restrictions at the intergroup level from personal autonomy support, we tested whether the collective autonomy restriction manipulation would influence group members’ perception of receiving personal autonomy support from other ingroup members. We did not expect a significant effect.

Method

This study was approved by the McGill REB-II (REB# 35-0613), under the project title: “The coat of arms paradigm: Exploring the effects of collective autonomy and collective distinctiveness on group cohesion and motivation”

Participants. A total of 415 participants took part in the experiment. Data collection took place over a two-year period\(^\text{16}\). It was our goal to recruit roughly 400 participants (and 30 groups

\(^\text{16}\) A two-year period was necessary for data collection given the resources and time required to run this extensive experiment and our objective to recruit our target sample. During the two-year experiment, we measured other outcomes that are beyond the scope of the present research (See Supplemental Materials). As well, during the second semester of the first year of data collection, we added two additional independent conditions to the study that were part of the thesis of an undergraduate research student. These conditions were not part of the original experimental design, and were designed to answer a specific question of the undergraduate research student. As such we did not include the participants randomly assigned to these additional conditions in the present research. Finally,
per condition) to have sufficient statistical power to perform multilevel and group level analyses which would be necessary given the nested nature of our experimental design (Maas & Hox, 2005; Scherbaum & Ferreter, 2009). Participants were recruited from the McGill University community (i.e., through a paid participant pool, an extra-credit psychology participant pool, McGill classified ads and posters). Participants were compensated with twenty dollars for engaging in the two-hour experiment or with two extra credits in their psychology course. Twelve participants were unable to complete the experiment due to not enough participants attending the session, or because of a computer error. A further 14 participants were excluded because they had missing data for the key outcomes (i.e., personal autonomy, satisfaction with GQ avatar) focused on in the present research. A total of 389 participants (95 groups) were included in our analyses (collective autonomy restriction, N=131, 31 groups; collective autonomy support, N=120, 30 groups; control condition, N=138, 34 groups; 288 Female, 96 Male; 5 not specified $Mage=20.71$, $SD=3.48$).

**Procedure**

Participants were recruited in groups of up to ten people, and were randomly divided into two separate groups of three to five people by drawing slips$^{17}$. After group categorization, participants followed one experimenter into one of two separate testing rooms and did not interact directly with the other group for the remainder of the study.

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$^{17}$ We repeated all of the analyses for Study 2 controlling for group size and we found that the significance of our results did not change. Furthermore, group size had no significant impact on any of the key outcomes of Study 2 (See Supplemental Analyses 13).
Once in their separate rooms, participants were told that they would first create a meaningful group identity and then play an interactive multiplayer video game, in which they would control an avatar based directly on their newly created group identity (See Supplementary Materials for complete instructions provided to participants)18.

**Defining a meaningful culture and identity in the lab.** To create a meaningful group identity, groups used an interactive computer program (see Figure 3) to create a *coat of arms*—a shield adorned with a collection of colors, objects and animals (called charges) that visually symbolize shared traits and values. We selected this task as visually symbolizing group identity is an ancient human practice (Fox-Davies, 1909) and promotes group members to perceive their group as a unified and cohesive entity (Callahan & Ledgerwood, 2016). Groups selected between six different colors for both their shield and their charge, and between six possible charge options. The program provided detailed descriptions of the values and traits that each charge and color symbolized. For example, a boar charge was described as symbolizing “*that group members are physically strong and courageous. They enjoy feats that challenge their physical strength and their ferocity of spirit.*” Participants could also pick a *group name* and *group motto* for their coat of arms.

Prior to creating their coat of arms, participants were informed that their group identity would directly impact their experience when playing the multiplayer video game that would follow. Specifically, participants were told: “*We’ll enter your choices into the game, and you’ll then get the corresponding character. Just like in many video games, the identity of your character will have an effect on its abilities and powers.*” To ensure that potential differences in

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18 During the first year of data collection the study description was delivered verbally to participants, and participants also read a written description of the experiment. During the second year of data collection we created a video of these verbal/written instructions to reduce potential experimenter variance.
group members’ satisfaction with their in-game avatar would be attributable to a lack of collective autonomy rather than a perceived inferiority of a new identity, we explicitly told participants that, “while all the colours and charges give you unique powers, they are all equally useful for game play.” Group members were then left alone to create their coat of arms. Informal analysis of video footage taken of participants creating their coat of arms revealed that group members actively engaged in discussions of the meaning and potential value of the different options of the coat of arms (note that participants did not know they were being videotaped until the end of the study). Participants spent an average of 9.65 minutes creating their coat of arms (range= 2.80, 29.00, SD=5.20). Once the group created their coat of arms, it was printed in color by the experimenter and given back to the group.

Practicing group culture in the lab. We created an interactive group-based video game called Group Quest using the War Craft 3 map editor (Blizzard Entertainment, 2002). In this game, group members controlled an in-game avatar that was a direct reflection of their group’s coat of arms. Prior to game-play, group members input the attributes of their coat of arms after which a feedback message appeared on screen ostensibly linking the unique abilities of the avatar to the group’s selections. For example, participants who selected a red shield with a black boar charge that symbolizes physical strength would control a black and red boar avatar said to have the most powerful melee attacks. In reality, all in-game avatars had identical gameplay statistics and abilities. Figure 4 shows in-game footage of participants controlling an avatar derived from a black/green coat of arms with a spider charge. Group members played the game at separate computers but were connected virtually within the video game. Group members frequently interacted with each other by talking in-person during game play.
The game consisted of six different quests that involved solving puzzles and destroying enemies controlled by the computer’s artificial intelligence. Group members were encouraged to cooperate as the game’s objective could not be completed without teamwork. Participants were never competing directly with members of the other group but were told to try and complete as many in-game objectives as possible during the 21 minutes they had to play the game.

**Experimental Manipulation.** Prior to forming their Coat of Arms participants were told that one of the two groups, randomly selected, would have the power to control a certain aspect of the experiment. In all conditions, participants were always told that the other group had this power.

In the *collective autonomy restriction condition* and in the *collective autonomy support condition*, participants were told prior to creating their coat of arms that the outgroup had the power to look over and alter their ingroup’s coat of arms (See supplementary materials for script). After group members created their coat of arms, the experimenter ostensibly left the room to show the coat of arms to the other group. In the *collective autonomy restriction* condition, the experimenter reentered the room with a modified coat of arms and stated:

“The other group had a hard time deciding whether or not they wanted you to keep your own coat of arms design. But in the end they decided to change your coat of arms design.”

The coat of arms was systematically altered by changing the charge, the shield colour and the colour of the charge.¹⁹

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¹⁹ We systematically altered the chosen shield color, charge color and charge by always replacing group members’ chosen option, with the next available option in the coat of arms generator, to the right of participants’ chosen option. The coat of arms was modified in a separate room so that group members could not see the experimenter altering their coat of arms.
In the *collective autonomy support* condition, the experimenter reentered the room with a modified coat of arms and stated:

“The other group had a hard time deciding whether or not they wanted you to keep your own coat of arms design. But in the end they decided NOT to change your coat of arms design.”

Finally, in a *control condition*, the outgroup was given control over an aspect of the experiment unrelated to the ingroup’s collective autonomy. Specifically, prior to creating their coat of arms, participants were told that the outgroup could choose in which experimental lab room each group would play the multiplayer video game (See Supplemental Materials for script)\(^{20}\).

**In-Game Satisfaction with Identity-Accordant Behaviors.** During the 21 minutes that group members played *Group Quest*, the video game was programmed to “pause” after seven minutes, fourteen minutes, and twenty-one minutes. During this time, participants privately answered a pop-up question that appeared on their screen asking: “How satisfied are you with your group identity and your corresponding GQ unit so far?” and “How much have you enjoyed playing Group Quest so far?” Both items were rated using a 7-point Likert scale (1=not at all, 7 =very much). These items were included to allow us to disentangle effects of our manipulation on group members’ satisfaction with their identity-based group from their overall enjoyment of the game. We computed composite scores of identity satisfaction and game play enjoyment by taking the mean of the three responses across the 21 minutes of game play (satisfaction with identity aspects of *Group Quest*, \(\alpha=.83\); general enjoyment of *Group Quest*, \(\alpha=.83\)).

\(^{20}\) During the first year of data collection, the experimenter reentered the room prior to ingroup members creating their coat of arms and told participants that the outgroup would like to stay in their initial room. During the second year of data collection, we gave this feedback to participants after they had created their coat of arms. We made this modification so that the timing of this feedback would be consistent with when the feedback was given to participants in the collective autonomy threat/support conditions (upon completion of the coat of arms). Importantly however, as shown in Supplemental Analyses 12, our results did not change when controlling for the year in which the study was conducted.
**Post-game follow-up questionnaire**

After group members finished playing *Group Quest* they each (individually) completed a larger questionnaire that included the variables focused upon in the present research (See Supplemental Materials for the full questionnaire). All items were assessed using a 7-point Likert scale (1=strongly disagree, 7=strongly agree).

**Restrictions to Collective Autonomy.** Group members’ perception that the other group attempted to restrict their collective autonomy was assessed using five items ($\alpha=.90$) that we adapted from our validated scale of collective autonomy restrictions (see Study 1). Items included: “The other group pressured our group to adopt values that were not our own”; “The other group imposed things onto our group’s identity”; “The other group told our group what we could and could not do”; “We felt pressured by the other group”; “We felt controlled by the other group”.

**Personal Autonomy and Personal Competence.** As in Study 1, personal autonomy was again assessed using four items ($\alpha=.56$) adapted from Sheldon and Gunz’s (2009) need satisfaction scale, which were phrased with respect to how group members felt “Over the course of the experiment”. Items included: “I had a lot of pressures I could do without (reverse scored)”; “I was free to do things my own way”; and “I had to do things against my will (reverse scored)”, and “I was really doing what interested me”. To gauge whether the effect of our manipulation was specific to personal autonomy, we also included four items ($\alpha=.60$) from Sheldon and Gunz assessing personal competence (efficacy). Items included: “I took on and mastered hard challenges”; “I did well even at the hard things”; “I experienced some kind of failure, or was

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$^{21}$ It is possible that the extent to which participants generally enjoy playing video games might impact the extent to which they would feel satisfied with their in-game avatar or feel personally autonomous to play video games during the experiment. We assessed participants’ enjoyment of playing video games in general and found that the significance of our results did not change when controlling for this variable (See Supplemental Analyses 14).
unable to do well at something (reverse scored)”; and “I did something stupid, that made me feel incompetent (reverse scored)”.

**Potentially overlapping variables.** Group identification was assessed with nine items \((\alpha=.81)\) adapted from Cameron tripartite scale of group identification (2004). Sample items are: “In general, I was glad to be a member of my group”; “I felt strong ties to members of my group”; and “During the study, being a part of my group was an important part of my self-image”. Collective agency was assessed using three items \((\alpha=.60)\) adapted from Shnabel and Nadler (2008). These items were: “During the study we felt relatively strong as a group”; “During the study we had a lot of influence on what we did”; and “During the study we had a lot of control over what we did”. Autonomy support from other ingroup members was measured with eight items \((\alpha = .83)\) from Williams and colleagues’ (1996) scale of autonomy support. A sample item is: “The members of my group listened to how I would like to do things”.

**Results**

**Multi-Level Analysis Strategy.** Participants were nested within unique groups of 3-5 participants for the duration of the experiment and had unique interactions with their group members while completing the various dynamic group tasks of the experiment. Thus, we utilized multilevel linear modeling (Finch et al., 2014; Hayes, 2006; Raudenbush & Bryk, 2002) to test the fixed effect of condition (level 2) on our key outcomes (level 1), while accounting for the random effect of participants’ unique group. All analyses were conducted with R (Finch et al., 2014) using the lme4 package (Bates et al., 2016). To test the significance of our fixed effects, we used the LmerTest package (Kuznetsova, Brockhoff, & Christensen, 2015) to compute t-statistics using the Satterthwaite approximation that is robust to heterogeneous variance between groups and is recommended for multi-level analyses.
Means, intraclass correlation coefficients, and inter-correlations for all measured variables are summarized in Table 11. The intraclass correlation coefficients (ICCs) for the different outcomes ranged from being relatively large given the size of our groups (Bliese, 2000) to being close to zero. With respect to perceived restrictions to collective autonomy, a large ICC (ICC=.52, 95% CI[.49, .54]) was observed, indicating that group members’ perception of their group’s autonomy was related to how other members within their unique group perceived their collective autonomy. In contrast, the ICC for group members’ personal autonomy was zero indicating that the unique group to which participants were assigned to did not impact their personal autonomy. The relatively large ICC for perceived restrictions to collective autonomy indicates that although collective autonomy is a subjective perception held by group members, there is likely some consensus among group members about the state of the group’s collective autonomy.

**Manipulation Check.** Analyses revealed that the collective autonomy restriction manipulation was successful. As expected, participants in the collective autonomy restriction condition reported significantly greater feelings of having their collective autonomy restricted ($M=3.94, SD=1.38$), relative to participants in the control condition ($M=1.45, SD=.84$), $\gamma=-2.49$, 95% CI[-2.75, -2.23], $t(91.88)=-18.59, p<.001, r=.89$, and participants in the collective autonomy support condition ($M=1.43, SD=.81$), $\gamma=-2.51$, 95% CI[-2.78, -2.24], $t(90.12)=-18.20, p<.001, r=.89$. Participants in the collective autonomy support condition did not differ in perceived collective autonomy restriction relative to participants in the control condition, $\gamma=-.02$, 95% CI[-.29, .25], $t(95.18)=-.13, p=.90, r=.01$. In sum, group members who lost their collective autonomy felt that their collective autonomy was restricted to a significantly greater extent than
group members who had their collective autonomy respected by the outgroup, or, who were not in an intergroup context in which their collective autonomy was in jeopardy.

**Satisfaction with In-Game Avatar.** We next tested our basic assumption that group members prefer acting in accord with the identity that they autonomously developed, rather than in accord with an identity that was forced upon their group by an outgroup. As expected, participants in the collective autonomy restriction condition reported significantly less satisfaction with their in-game avatar ($M=4.87$, $SD=.99$) than participants in the control condition ($M=5.27$, $SD=.91$), $\gamma=.40$, 95% CI[.16, .63], $t(88.51)=3.26$, $p=.002$, $r=.33$, and participants in the collective autonomy support condition ($M=5.38$, $SD=1.02$), $\gamma=.51$, 95% CI[.27, .76], $t(88.65)=4.06$, $p<.001$, $r=.40$. There were no significant differences in satisfaction between group members in the collective autonomy support condition and the control condition, $\gamma=.11$, 95% CI[-.13, .36], $t(91.88)=.92$, $p=.36$, $r=.10$. Also, we did not find that adding the effect of condition significantly improved the model fit relative to the null model in predicting group members’ general enjoyment of playing the Group Quest video game, $\chi^2=2.17$, $p=.34$, $R^2_{.1}=.00$. Thus, the collective autonomy manipulation appeared to only impact participants’ satisfaction with aspects of Group Quest that were directly linked to their group identity and group culture.

**Personal Autonomy.** We next tested our primary hypothesis that restricting a group’s collective autonomy would undermine the personal autonomy of individual group members. Supporting our overarching hypothesis, analysis revealed that participants in the collective autonomy restriction condition reported feeling significantly less personal autonomy during the experiment ($M=5.09$, $SD=1.09$) than participants in the control condition ($M=5.37$, $SD=.97$), $\gamma=.28$, 95% CI[.04, .52], $t(386)=2.27$, $p=.02$, $r=.11$, and significantly less personal autonomy than participants in the collective autonomy support condition ($M=5.40$, $SD=.94$), $\gamma=.31$, 95%
CI[.06, .56], $t(386)=2.43, p=.02, r=.12$. However, there were no significant differences in personal autonomy between group members in the collective autonomy support condition and the control condition, $\gamma=.03, 95\% CI[-.22, .28], t(386)=.24, p=.81, r=.01$. Also, we did not find that adding the effect of condition significantly improved the model fit relative to the null model in predicting group members’ feelings of personal competence during the experiment, $\chi^2=1.30, p=.52, R^2_i=.00$. Thus, restricting a group’s collective autonomy appeared to specifically impact group members’ personal sense of autonomy but not their personal sense of competence.

**Effect on potentially overlapping variables.** Consistent with our previous studies, we again did not find significant effects of condition on group identification, collective agency, or perceived personal autonomy support from other members within one’s ingroup (See Table 12). Thus, restrictions to a group’s collective autonomy appear to affect group members’ independently of these other factors previously considered within SDT and SIT.

**Discussion**

Building on the first three studies, Study 4 provided experimental evidence that restricting a group’s collective autonomy may undermine the extent to which individual group members feel personally autonomous. As hypothesized, members of groups that had their collective autonomy restricted by the high-power group experienced less personal autonomy than group members who did not have their collective autonomy restricted (i.e., those in the support and control conditions). Group members in the support condition did not differ from those in the control condition—this was expected given that groups in both conditions were equally free to practice their culture and did not face any restrictions to their collective autonomy.

An argument could be made that group members’ in the collective autonomy support condition, who had the potential to have their collective autonomy restricted, could have
experienced less personal autonomy relative to those in the control condition who were never at risk. However, the present findings are in fact consistent with SDT based research (e.g., Ryan & Deci, 2017), which finds that relatively low-power individuals (e.g., children, students, employees, patients) will not necessarily experience reduced personal autonomy despite having the potential to have their personal autonomy restricted by high-power individuals to whom they are dependent (e.g., parents, teachers, bosses, doctors).

Study 4 also provides experimental evidence for the basic assumption that group members prefer acting in accord with their self-defined culture, rather than a different culture that was forcefully imposed on their group. While this finding is intuitive, it speaks to the potential psychological cost that may be experienced by group members who are forced to practice cultural customs and values that they did not choose, and do not desire.

Finally, Study 4 provides further evidence that restrictions to a group’s collective autonomy have specific implications for the personal autonomy of group members. Indeed, our manipulation had no significant impact on group members’ perception of feeling strong, powerful and in control as a group (i.e., collective agency), group identification, or their feeling personally supported by other ingroup members. Furthermore, while restricting a group’s collective autonomy impacted group members’ feeling of personal autonomy, the personal competence and efficacy experienced by group members was not impacted by such restrictions.

Of course, a laboratory simulation involving novel groups and a newly formed social identity cannot truly emulate the emotional valence and complexities inherent to real-world contexts. Losing the ability to define the identity of an artificial group, and not being permitted to control a desired avatar in a video game, is by no means equivalent to enduring devastating processes such as slavery, forceful colonization, and laws and sanctions that prevent group
members from practicing their culture. Yet, despite this limitation, a two-hour artificial experiment was sufficient to undermine group members’ own personal sense of autonomy. Furthermore, it was clear that during this simulation, group members were not satisfied with behaving in ways that did not reflect their chosen identity. If a reductionist and controlled laboratory experiment could induce these responses, this suggests that the psychological implications of experiencing real-world threats to collective autonomy may be even more profound.

**General Discussion**

Human history is rife with examples of attempts by one social group to restrict the freedom of another social group to determine and practice their own identity. From Apartheid to African-American Slavery and the suppression of Indigenous cultures in Canada and elsewhere, the collective autonomy of various social groups has been actively undermined. Herein, we examined the heretofore untested idea that restrictions to collective autonomy have implications for the personal needs and psychological functioning of group members. Specifically, we tested the novel idea that people would experience reduced personal autonomy when they felt their group’s collective autonomy had been restricted. Moreover, because of its negative impact on personal autonomy, restriction to collective autonomy was predicted to have an indirect association with reduced psychological well-being.

Empirical support for our suppositions was derived from four different research contexts and seven independent samples (including a supplemental study). In Study 1, perceived restrictions to the collective autonomy of one’s national, racial, ethnic, and/or religious group, was directly associated with reduced personal autonomy, and indirectly associated with reduced psychological well-being across a culturally diverse sample. In Study 2, across three assessment
periods during a four-month period, having an overall impression that the collective autonomy of one’s national, racial, ethnic, and/or religious group was being restricted was associated with experiencing less personal autonomy, and in turn, less psychological well-being. Study 3 manipulated people’s perception that the collective autonomy of their national, racial, ethnic, and/or religious group had been restricted and found that priming restrictions to collective autonomy directly reduced personal autonomy and indirectly reduced personal autonomy relative to priming collective autonomy support. Finally, Study 4 manipulated the extent to which newly created groups in the laboratory had their collective autonomy restricted by a high-power outgroup. Group members who had their collective autonomy restricted felt less personally autonomous, relative to members of groups that did not have their collective autonomy restricted. Moreover, in this context, group members preferred to behave in accord with the values, customs and practices of their own self-determined identity as opposed to those that may be imposed forcefully upon their group.

Together, these studies yield a consistent and clear pattern of results—restrictions to collective autonomy reduce feelings of personal autonomy, which has negative downstream consequences on psychological well-being. Importantly, the direct and indirect effects of collective autonomy restriction were observed using a diverse array of methodologies and assessment approaches. To be clear, we found evidence for these relationships within the context of real-world cultural groups (Studies 1-3), as well as within the context of newly formed laboratory groups (Study 4). Moreover, perceived restrictions to collective autonomy were associated with reduced personal autonomy and well-being amongst people residing in relatively individualistic countries, as well as people residing in relatively collectivistic countries (Studies 1 and 3). Additionally, the associations between collective autonomy restrictions, personal
autonomy, and psychological well-being was observed regardless of whether collective autonomy restriction was assessed using an eight-item measure (Studies 1 and 3) or a shortened two-item measure (Study 2). Lastly, the indirect effect of collective autonomy restrictions on well-being was consistent using a wide array of well-being measures (i.e., life-satisfaction, self-esteem, and self-actualization) as well as when a clinical measure of depression was used. As such, the proposed model should be considered robust.

Theoretical Implications

To date, SDT (Ryan & Deci, 2017) has considered how people might feel when their personal autonomy has been restricted by other individuals: The controlling teacher, the manipulative boss, and the bribing parent. At a more pervasive intragroup level, SDT has also considered how hierarchal and oppressive intragroup structures that demand that the individual submit to authority might undermine group members’ personal autonomy (Chirkov et al., 2003; Downie et al., 2007). Broadening the scope of SDT, the present research finds that perceived restrictions to collective autonomy at the intergroup level are distinct from these other pervasive factors. Specifically, in Study 1, restrictions to collective autonomy were uniquely associated with reduced personal autonomy and well-being when statistically controlling for whether group members had autonomous versus controlled reasons for acting in accordance with their identity (e.g., Chirkov et al., 2003; Downie et al., 2004) and when statistically controlling for whether they felt that their autonomy was supported by other ingroup members (Downie et al., 2007). Furthermore, our experimental manipulations did not significantly impact these potentially overlapping factors (Studies 3 and 4).

In sum, extending self-determination theory, the present research shifts attention away from the individual, to one’s group as an entity within an intergroup context. Importantly, our
findings do not discount the critical impact that autonomy restricting factors acting directly on the individual, such as rewards, punishments and an oppressive intragroup environment, might have for people’s personal autonomy and psychological well-being. Rather, we highlight that people’s sense of personal autonomy may be undermined not only when they feel that they have personally been controlled by others within their social group, but also, when they feel that their social group as an entity has been controlled and restricted by other groups—in other words, an oppressive intergroup environment.

The present research also expands SIT (Tajfel & Turner, 1979) by introducing collective autonomy as an important social identity factor to be considered in relation to psychological well-being. Importantly, perceived restrictions to collective autonomy appeared to be distinct from other social identity related factors previously associated with psychological well-being. In Study 1, our findings remained robust when statistically controlling for group identification—a factor previously associated with greater feelings of personal control and psychological well-being (Greenaway et al., 2015). Moreover, our experimental manipulations did not significantly affect group identification (Studies 3 and 4). Thus, it appears group members may remain identified with their group (or not) independently of whether they experience restrictions to their collective autonomy.

Associations between collective autonomy restriction and personal autonomy and well-being also remained robust in Study 1 when controlling for perceptions of collective control, efficacy and agency—the perception that one’s group can exert control over its environment and effectively achieve desired outcomes for its group (Jugert et al., 2016; Shnabel & Nadler, 2015). Similarly, in Studies 3 and 4, the collective autonomy restriction manipulations did not affect group members’ perception of feeling strong, powerful and in control as a group (i.e., collective
agency). As well, in Study 4, restrictions to collective autonomy did not significantly impact
group members’ personal competence during the experiment. Taken together, these results
differentiate being able to achieve desired outcomes as a group (i.e., control/agency/efficacy)
and feeling free to choose what outcomes to pursue as a group (i.e., collective autonomy). Such a
distinction had been made previously at the individual level (Deci & Ryan, 1985; Deci & Ryan,
1987; Ryan & Connell, 1989), but not at the collective level.

A fruitful avenue for future research will be to assess whether social identity factors, such
as group identification and collective control, influence how group members respond to
restrictions to their collective autonomy. For example, affirming group members’ sense of
collective control and/or identification with their group may mobilize group members to act in
ways that restore the collective autonomy of their group in the face of collective autonomy threat
(e.g., collectively protesting the restrictions imposed on their collective autonomy). This idea is
consistent with previous work showing that collective efficacy is vital for collective action
initiatives (Jugert et al., 2016; Van Zomeren et al., 2008).

More generally, the present research contributes to a broader social-identity-based
theoretical perspective proposing that the manner in which individuals define and perceive
themselves is shaped by their social identity and perception of the relevant intergroup context.
This literature includes research documenting positive associations between collective esteem
and personal esteem (Luhtanen & Crocker, 1992), collective control and personal control
(Greenaway et al., 2015; Tiessen et al., 2009), collective identity clarity and personal identity
clarity (Usborne & Taylor, 2010), and social identity and one’s personal goals, aspirations, and
ideal possible-selves (Debrosse, Rossignac-Millon, & Taylor, 2017; Oyserman, 2007). Here, we
provide a novel psychological mechanism through which people’s self-concept and personal
experience may be influenced by their social identity—collective autonomy. In doing so, we apply a social-identity-based theoretical perspective to SDT.

To date, the SDT framework does not address whether *competence* and *relatedness* (two other basic psychological needs) are influenced by intergroup contexts. However, there is empirical evidence stemming from the SIT framework that both competence needs and relatedness needs may be influenced by intergroup factors. For example, with respect to relatedness needs, Branscombe, and colleagues (1999) find that being the target of discrimination may promote individuals to feel rejected and disconnected from their broader society, yet at the same time, feel more related to other members within their oppressed ingroup. As well, with respect to competence needs, there is extensive evidence that the negative stereotypes which may be salient within one’s intergroup context may either adversely impact the competence needs of the stereotyped group (Schmader, Johns, & Forbes, 2008; Steele & Aronson, 1995), or, be used by group members to protect their self-efficacy (Crocker & Major, 1989). Thus, a potential avenue for future research may be to further synthesize SIT and SDT into a unified model describing how all *three* basic psychological needs for personal autonomy, competence, and relatedness may be impacted by one’s intergroup context.

**Implications for Intergroup Relations**

At a societal level, the findings of the current research speak to the importance of social groups respecting each other’s collective autonomy. Individuals from distinct cultural backgrounds constantly interact within an ever-expanding and interconnected global community (Chen et al., 2016). In such contexts, it is possible that social groups with different cultures may not always agree about what cultural practices, customs and values are acceptable to practice within their shared society. When one cultural group views the cultural practices of another
outgroup to be unacceptable, it may try to regulate how that outgroup practices its culture. For example, in France, Muslim women are not permitted to wear facial coverings such as burqas and niqabs in public spaces (Adrian, 2015; Ramirez, 2014). This legislation passed following some French officials who spoke out negatively regarding such female body coverings, describing them as oppressive to women. However, many Muslim women have publically condemned France for restricting their freedom to choose for themselves how they dress. Our research sheds light on the underlying psychological mechanism that lead group members to feel threatened by such restrictions being placed on how they practice their culture. Namely, restrictions to collective autonomy thwart group members’ basic psychological need to feel personally autonomous, and undermine their psychological well-being.

At this juncture, it is important to note that we do not wish to imply that it is acceptable, in the name of collective autonomy, to be indifferent to social groups that engage in cultural practices that may have serious adverse consequences for the psychological and/or physical well-being of its ingroup members. Nor do we wish to insinuate that third-party groups should *never* intervene if they see members of another group engaging in especially destructive intragroup practices. However, we do argue that it is important for groups to be cognizant of and sensitive to the possibility that such well-meaning interventions may restrict the collective autonomy of other outgroups, and in fact may backfire, by diminishing the well-being of outgroup members, and by causing potential intergroup conflict. Thus, great consideration should be employed first, before a group attempts to interfere with how another group expresses and practices its culture. In this regard, Isaiah Berlin poignantly explained that people might prefer to be ruled over by dictatorships and authoritarian regimes from within their own group, as opposed to “some
cautious, just, gentle, well-meaning administrator from the outside” (Berlin, 1969, p. 24; c.f., Klabbers, 2006).

Caveats and Future Directions

Before concluding, we note some caveats of the present research. First, we do not conceptualize collective autonomy as a basic psychological need in and of itself, as may be the case for personal autonomy (Ryan & Deci, 2017). Indeed, the impact that perceived restrictions to collective autonomy had for well-being appears to be a consequence of its indirect effect through personal autonomy, rather than a direct effect. Furthermore, although we found consistent evidence across the three studies that collective autonomy influences group members’ personal autonomy, the size of these effects ranged from modest to moderate. Thus, substantially more research linking collective autonomy to personal autonomy and psychological well-being would be needed before making the claim that collective autonomy constitutes a basic psychological need in and of itself (Ryan, 1995).

Findings (Study 4) also indicate that while restrictions to collective autonomy may reduce group members’ personal autonomy, an outgroup choosing not to restrict one’s collective autonomy (what we termed collective autonomy support) did not significantly impact group members relative to control. In the context of the present research we did not expect differences between the control and support conditions, as the “support” provided by the outgroup was a passive decision not to restrict the collective autonomy of the ingroup. Thus, in both the support and control conditions, group members experienced equal amounts of collective autonomy. On this basis, it appears that group members’ personal autonomy might not necessarily be boosted when they feel “supported” by other groups in terms of other group’s choosing not to restrict their collective autonomy. Moreover, it may be that receiving collective autonomy support from
the outgroup is especially important in contexts in which the outgroup is asking the ingroup to fully internalize a new value or custom into their culture. For example, in the context of Study 4, ingroup members may have felt autonomous about having their culture changed if the outgroup provided a rationale for doing so, acknowledged the outgroup’s potential ambivalence, and offered the outgroup a chance to refuse doing so. At the individual level, personal autonomy support involving these components has been shown to be vital for promoting individuals to fully internalize new values and behaviours into their self-concept (Ryan & Deci, 2017). Future work will be necessary to explore how more active forms of collective autonomy support, which involve the outgroup acknowledging and affirming the importance of the ingroup’s collective autonomy (see Kachanoff, Caouette, Wohl, & Taylor, 2017) may influence group members’ personal autonomy and well-being.

Additionally, while group members’ psychological well-being was sensitive to within-person fluctuations in personal autonomy, group members were only affected by their global (between-person) perception that their collective autonomy has been restricted. The fact that group members were not sensitive to within-person fluctuations in collective autonomy restriction is consistent with the idea that people’s perception of their group’s collective autonomy should be relatively stable, barring major intergroup events that might impact their group. Moreover, given that group-level perceptions such as collective autonomy are construed at a high level (McCrea et al., 2012; Turner et al., 1987) people should be less impacted by situational fluctuations in their collective autonomy (Trope & Liberman, 2010).

Limitations of the present research should also be acknowledged. Due to data collection via online platforms (MTurk and Crowdflower), a significant amount of data was lost due to participants failing to adequately complete the survey. Importantly however, in the online
experimental study (Study 3) the number of inadequate responses was equivalent across the experimental conditions, and our results remained consistent when including participants who failed our attention checks. Moreover, we found consistent findings (Study 2) when employing similar methodology with a university student sample and a sample recruited via crowdsourcing. Specifically, we replicated the findings of Study 2 (conducted with a University student sample) with an online MTurk sample (see Supplemental Study 1).

As well, an initial attempt was made in Study 1 and Study 3 to generalize our results across collectivistic and individualistic cultures. We found that our collective autonomy scale was invariant across people recruited from relatively collectivistic and individualistic countries (See Supplemental Analysis 1). Furthermore, we found that the key associations between perceived collective autonomy restriction and personal autonomy support and well-being was not moderated by the IDV score of people’s country of citizenship in Studies 1 and 3. Additionally, multi-level analyses found that our results remained consistent in both Study 1 and Study 3 when including country as a random factor (See Supplemental Analyses 7 & 11). However, a limit of this work is that the majority of participants within Studies 1 and 3 resided in America and India. Future work, employing a much larger and more balanced assessment of people from different countries, such as the World Values Survey (2014) will be needed to further assess the cross-cultural generalizability of these findings.

**Conclusion**

Across four diverse research contexts we provide robust evidence that group members may experience reduced personal autonomy and psychological well-being when they feel that the collective autonomy of their social group has been restricted. Currently, there are societal processes in place that restrict the collective autonomy of certain groups to define and practice
their culture (e.g., the banning of Muslim women wearing hijabs in parts of Europe). Other
groups must endure and reconcile a collective history that is defined in part by lacking collective
autonomy (e.g., African Americans’ legacy of slavery). Our findings shed further light as to the
underlying psychological mechanisms for why such processes may have profound and
detrimental consequences for the psychological health of group members. Going forward, by
mutually respecting each other’s collective autonomy, groups may ensure all people do not suffer
the psychological toll of losing their basic right to determine and practice their own culture.
References


Bates, D., Maechler, M., Bolker, B., Walker, S., Christensen, R. H. B., Singmann, H., ... & Green, M. B. (2016). Package ‘lme4’.


Radloff, L. (1977). The CES-D scale: A self-report depression scale for research in the general
THE CHAINS ON ALL MY PEOPLE

population. *Applied Psychological Measurement, 1*, 385-401. DOI:
10.1177/014662167700100306

Ramírez, Á. (2015). Control over female ‘Muslim’ bodies: culture, politics and dress code laws in some Muslim and non-Muslim countries. *Identities*, 22, 671-686. DOI:
10.1080/1070289X.2014.950972


10.1177/0146167201272002


Sheldon, K. M., & Gunz, A. (2009). Psychological needs as basic motives, not just experiential requirements. *Journal of Personality, 77*, 1467-1492. DOI: 10.1111/j.1467-6494.2009.00589.x


24, 477–483. DOI: 10.1177/0963721415601625


Table 1. The collective autonomy restriction scale. Columns summarize the corrected item-to-total correlations by sample.
Table 2. Intercorrelations between restrictions to collective autonomy, personal autonomy, collective agency, group identification and psychological well-being (Sample 1a).

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<td>1. Restrictions to Collective Autonomy</td>
<td>4.47</td>
<td>1.59</td>
<td>-.49***</td>
<td>-.24**</td>
<td>-.16(\text{!})</td>
<td>-.23**</td>
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</tr>
<tr>
<td>2. Personal Autonomy</td>
<td>4.96</td>
<td>1.04</td>
<td></td>
<td>.26**</td>
<td>.25**</td>
<td>.47***</td>
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</tr>
<tr>
<td>3. Collective Agency</td>
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<td>.22*</td>
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<td>4. Group Identification</td>
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<td></td>
<td></td>
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<td>.34***</td>
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<td>5. Psychological Well-Being</td>
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<td>0.75</td>
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</tbody>
</table>

*Note* \(p<.05\), **\(p<.01\), ***\(p<.001\), \(\text{!} \ p < .10\)
Table 3. Intercorrelations between restrictions to collective autonomy, personal autonomy, collective agency, group identification, personal autonomy support, and personal regulatory style (Sample1b).

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<td>0.22*</td>
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<td>0.60***</td>
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<td>3. Collective Agency</td>
<td>5.97</td>
<td>1.21</td>
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<td>0.44***</td>
<td>0.42***</td>
<td>-0.03</td>
<td>0.15*</td>
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<td>4. Group Identification</td>
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<td>0.79</td>
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<td>0.57***</td>
<td>0.29***</td>
<td>0.28**</td>
</tr>
<tr>
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<td>5.56</td>
<td>0.91</td>
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<td></td>
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<td>0.45***</td>
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Note *p < 0.05, **p < 0.01, ***p < 0.001, \( \wedge p < 0.10\)
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<td>1.54</td>
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<td>-0.21***</td>
<td>-0.14***</td>
<td>0.49***</td>
<td>-0.05</td>
<td>-0.17***</td>
<td>-0.11*</td>
<td>-0.16**</td>
<td>-0.09\</td>
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<td>1.03</td>
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<td>-0.16**</td>
<td>0.17***</td>
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<td>0.42***</td>
<td>-0.06</td>
<td>0.36***</td>
<td>0.10\</td>
<td>0.22***</td>
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<td>4. Collective Efficacy</td>
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<td>0.88</td>
<td></td>
<td></td>
<td></td>
<td>-0.16**</td>
<td></td>
<td>0.53***</td>
<td>0.10\</td>
<td>0.50***</td>
<td>0.29***</td>
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<td>-0.10*</td>
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<td>1.01</td>
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<td>0.61***</td>
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<td>4.44</td>
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<td>0.34***</td>
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<td>8. Personal Autonomy Support</td>
<td>5.39</td>
<td>0.90</td>
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Note: *p < 0.05, **p < 0.01, ***p < 0.001, \( p < 0.10\)

Table 4. Intercorrelations between collective autonomy restrictions, personal autonomy, collective agency, collective efficacy, internal locus of collective control, group identification, personal autonomy support, personal regulatory style, and psychological well-being (Sample 1c).
Table 5. Summary of the regression coefficients (standardized beta-coefficients and 95% confidence intervals) in relation to personal autonomy for each of the sub-samples of Study 1.

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<th>Sample</th>
<th>β</th>
<th>95% CI</th>
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<th>β</th>
<th>95% CI</th>
<th>Sample</th>
<th>β</th>
<th>95% CI</th>
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<td>1a</td>
<td>.16</td>
<td>-.06, .48</td>
<td>1b</td>
<td>-.06</td>
<td>-.38, .21</td>
<td>1c</td>
<td>-.10</td>
<td>-.24, .03</td>
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<tr>
<td>Group Identification</td>
<td>.18</td>
<td>-.02, .30</td>
<td>Collective Agency</td>
<td>.23*</td>
<td>.03, .39</td>
<td>.05</td>
<td>-.06, .14</td>
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<tr>
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<td>Personal Regulatory Style</td>
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<td>-.06, .50</td>
<td>.17**</td>
<td>.05, .35</td>
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<td>Collective Efficacy</td>
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<td>.07, .46</td>
<td>.22***</td>
<td>.10, .33</td>
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<td>-.36, .22</td>
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<td>-.06, .31</td>
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<td>.00, .55</td>
<td>.17**</td>
<td>.05, .34</td>
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<td>Collective Efficacy</td>
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<td>.00, .39</td>
<td>.19***</td>
<td>.08, .30</td>
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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, \( p < .10 \).
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<th>Direct Effect</th>
<th>Indirect Effect</th>
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<td>Total effect = -.09, SE= .04, t(119)=-2.08, p=.04, 95% CI [-.17, -.04]</td>
<td>Direct effect = .003, SE=.04, t(118)=.07, p=.95, 95% CI[-.08, .09]</td>
<td>Indirect effect = -.09, SE=.04, 95% CI[-.16, -.04]</td>
</tr>
<tr>
<td>1b</td>
<td>Total effect = -.10, SE= .04, t(122)=-2.42, p=.02, 95% CI [-.18, -.02]</td>
<td>Direct effect = -.04, SE=.04, t(121)=-1.14, p=.26, 95% CI[-.12, .03]</td>
<td>Indirect effect = -.06, SE=.02, 95% CI [-.11, -.02]</td>
</tr>
<tr>
<td>1c</td>
<td>Total effect = -.004, SE=.03, t(359)=-.16, p=.88, 95% CI[-.06, .05]</td>
<td>Direct effect=.03, SE=.03, t(358)=-1.22, p=.22, 95% CI[-.02, .08]</td>
<td>Indirect effect = -.04, SE=.01, 95% CI [-.06, -.02]</td>
</tr>
<tr>
<td>Total sample</td>
<td>Total effect = -.06, SE=.02, t(620)=-3.30, p=.001, 95% CI[-.10, -.03]</td>
<td>Direct effect=.01, SE=.02, t(619)=.78, p=.44, 95% CI[-.02, .05]</td>
<td>Indirect effect = -.08, SE=.01, 95% CI[-.10, -.06]</td>
</tr>
</tbody>
</table>

**Table 6.** Mediation analyses testing the indirect effect of collective autonomy restriction on personal psychological wellbeing via personal autonomy for each of the three sub-samples of Study 1 while controlling for potentially overlapping variables, and the total sample not including covariates (Study 1).
### Table 7. Intercorrelations between collective autonomy restrictions, personal autonomy, and psychological well-being over three time points (assessed six weeks apart) (Study 2).

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Note: *p < .05, **p < .01, ***p < .001, !p < .10
Table 8. Intercorrelations between collective autonomy restrictions, personal autonomy, collective agency, group identification, discrimination, personal autonomy support, personal regulatory style, and psychological well-being across experimental conditions of Study 3.

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<th>M</th>
<th>SD</th>
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<td>5.Discrimination</td>
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<td>8. Psychological Well-Being</td>
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Note *p<.05, **p<.01, ***p<.001
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<thead>
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<th>ANOVA Results</th>
<th>ANCOVA Results (controlling for restrictions to collective autonomy)</th>
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<tr>
<td>Collective Agency</td>
<td>$F(2,252)=.97, \ p=.33, \eta^2=.00$</td>
<td>$F(2,251)=.51, \ p=.47, \eta^2=.00$</td>
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<td>Group Identification</td>
<td>$F(2,253)=2.38, \ p=.13, \eta^2=.01$</td>
<td>$F(2,252)=1.20, \ p=.27, \eta^2=.01$</td>
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<tr>
<td>Personal Autonomy</td>
<td>$F(2,252)=.01, \ p=.93, \eta^2=.00$</td>
<td>$F(2,251)=.04, \ p=.85, \eta^2=.00$</td>
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<tr>
<td>Support from Ingroup</td>
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<tr>
<td>Members</td>
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<tr>
<td>Personal Regulatory Style</td>
<td>$F(2,253)=.84, \ p=.36, \eta^2=.00$</td>
<td>$F(2,252)=.26, \ p=.61, \eta^2=.00$</td>
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<tr>
<td>Perceived</td>
<td>$F(2, 253)=5.31, \ p=.02, \eta^2=.02$</td>
<td>$F(2, 252)=1.18, \ p=.28, \eta^2=.01$</td>
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<tr>
<td>Discrimination</td>
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**Table 9.** Effect of collective autonomy manipulation on potentially overlapping variables (Study 3).
Table 10. The conditional effect of perceived collective autonomy restrictions and condition on personal autonomy and psychological well-being for people from relatively collectivistic (SD=-1), moderately collectivistic/individualistic (SD=0) and individualistic countries (SD=1) in Study 3. Condition was dummy coded (collective autonomy restriction = 1, collective autonomy support = 2).
### Table 11. Intercorrelations between collective autonomy restriction, personal autonomy, personal competence, satisfaction with one’s Group Quest avatar, enjoyment of Group Quest, group identification, collective agency, and personal autonomy support across experimental conditions of Study 4.

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<td>[95% CI]</td>
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<tr>
<td>1. Restrictions to Collective Autonomy</td>
<td>2.29</td>
<td>1.58</td>
<td>.53 [.51, .56]</td>
<td>-22***</td>
<td>-10*</td>
<td>-19***</td>
<td>-10*</td>
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<td>-13**</td>
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<tr>
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<td>1.01</td>
<td>0</td>
<td>.47***</td>
<td>.30***</td>
<td>.31***</td>
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<td>.22***</td>
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<td>3. Personal Competence</td>
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<td>1.11</td>
<td>0</td>
<td>.30***</td>
<td>.34***</td>
<td>.33***</td>
<td>.23***</td>
<td>.30***</td>
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<tr>
<td>4. Satisfaction with GQ Avatar</td>
<td>5.17</td>
<td>0.99</td>
<td>.20 [ .11, .33]</td>
<td>.40***</td>
<td>.48***</td>
<td>.29***</td>
<td>.36***</td>
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<tr>
<td>5. Enjoyment of GQ</td>
<td>5.03</td>
<td>1.30</td>
<td>.23 [ .07, .35]</td>
<td>.18***</td>
<td>.18***</td>
<td>.07</td>
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<td>6. Group Identification</td>
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<td>0.88</td>
<td>.23 [.16, .33]</td>
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<td>.61***</td>
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<tr>
<td>7. Collective Agency</td>
<td>5.38</td>
<td>1.03</td>
<td>.31 [.26, .37]</td>
<td>.09</td>
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<tr>
<td>8. Personal Autonomy Support</td>
<td>5.60</td>
<td>0.84</td>
<td>[.00, .86]</td>
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*Note: *p<.01, **p<.01, ***p<.001.
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<th>Outcome</th>
<th>Model Fit (vs. Null Model)</th>
<th>Restriction vs. Control</th>
<th>Restriction vs. Support</th>
<th>Control vs. Support</th>
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<tr>
<td>Group Identification</td>
<td>$\chi^2 = 2.08, p = .35, R^2_I = .00$</td>
<td>$\gamma = -.02, 95% CI[-.26, .21], t(83.37) = -.18, p = .86, r = .01$</td>
<td>$\gamma = .14, 95% CI[-.10, .39], t(88.80) = 1.14, p = .26, r = .12$</td>
<td>$\gamma = .16, 95% CI[-.08, .40], t(91.33) = 1.33, p = .19, r = .14$</td>
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<tr>
<td>Collective Agency</td>
<td>$\chi^2 = 1.45, p = .48, R^2_I = .00$</td>
<td>$\gamma = .11, 95% CI[-.19, .42], t(85.40) = .73, p = .47, r = .08$</td>
<td>$\gamma = .19, 95% CI[-.13, .51], t(86.47) = 1.17, p = .24, r = .12$</td>
<td>$\gamma = .08, 95% CI[-.23, .39], t(88.03) = -.48, p = .63, r = .05$</td>
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<tr>
<td>Personal Autonomy Support</td>
<td>$\chi^2 = 4.03, p = .13, R^2_I = .05$</td>
<td>$\gamma = .03, 95% CI[-.17, .23], t(88.94) = .27, p = .79, r = .03$</td>
<td>$\gamma = .20, 95% CI[-.01, .41], t(88.00) = 1.86, p = .07, r = .19$</td>
<td>$\gamma = .17, 95% CI[-.04, .38], t(91.41) = 1.62, p = .11, r = .17$</td>
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Table 12. The effect of condition on the potentially overlapping variables accounted for in Study 4 (Collective Agency, Group Identification, and Personal Autonomy Support from other group members).
Figure 1. CFA model tested in Study 1. Collective Autonomy Restrictions (CAR) was defined as a first order latent variable comprised of eight observed scores.
Figure 2. CFA model tested in Study 1 ensuring that collective autonomy restrictions (CAR) and personal autonomy satisfaction (PAS) and personal autonomy frustration (PAF) comprise three separate constructs.
**Figure 3.** User interface of the coat of arms generator that group members used to form a novel and meaningful identity for their group in Study 4. Note: Groups selected: (1) a color for the background of their shield, (2) a charge for their coat of arms, (3) the color of their shield, (4) a motto for their group, and (5) a name for their group.
Figure 4. Game play snap-shot of the interactive video game, Group Quest used in Study 4. Note: Group members all controlled an identical “in-game” avatar which was a direct reflection of the colors and charge of their Coat of Arms (or of the new coat of arms their group was forced to adopt). Shown in the present example, is the Avatar produced from a coat of arms containing Green, Black, and a Spider charge.