COLLECTIVE AUTONOMY: IMPLICATIONS FOR INDIVIDUAL GROUP MEMBERS AND INTERGROUP RELATIONS

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This thesis is dedicated to and written in memory of Arthur, Bea, and Ralph. I love you forever and a day.

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CONTRIBUTION OF AUTHORS

This thesis contains two manuscripts of which I am the first author. I had the leading role in the genesis of the theoretical ideas behind this research, and in the development, design, implementation and interpretation of this research. I conducted all of the statistical analyses reported in this thesis, and I wrote the entirety of all three manuscripts. However, this research would not have been possible without the guidance of my supervisor Donald M. Taylor, and my collaborators, Julie Caouette, Michael Wohl, Nour Kteily, Thomas Khullar and Hyun Joon Park who are co-authors on this work. They have all contributed to the development, design, implementation and interpretation of this research, and gave me invaluable feedback during the writing stages of this research.

Please note that Study 1 (Sample C) of Manuscript 1 and Study 1 of Manuscript 2 utilize data from the same sample. Similarly, Study 2 of Manuscript 1 and Study 3 of Manuscript 2 utilize data from the same sample. In an attempt to promote an 'open' approach to psychological science, I have included extensive supplemental analyses and materials as appendices to complement the primary text of this thesis.

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ABSTRACT

Feeling a sense of personal autonomy and volition over one's actions is universally associated with experiencing greater psychological well-being and vitality (Ryan & Deci, 2017). Substantial research has examined the antecedent factors that either nurture or thwart one's basic psychological need to feel personally autonomous. Previous research considers personal autonomy in relation to proximal factors, such as the personal relationships people share with important members of their social groups (e.g., parents, teachers, doctors), and pervasive factors such as the values and structure of their cultural, and political ingroups. To date however, no research has considered how people's personal sense of autonomy might be impacted by the extent to which they feel that their social groups have *collective autonomy* in an *intergroup context*. The program of research described in the present thesis introduces the concept of collective autonomy: an individual group member's subjective perception that his or her group is free to determine and practice its own cultural identity, without the undue influence of other groups in society. By integrating models of social identity (Tajfel & Turner, 1979; Taylor, 2002) with self-determination theory (Ryan & Deci, 2017), I propose that feeling collectively autonomous will lead group members to feel personally autonomous as individuals, and thereby, experience greater psychological well-being. Moreover, because of the psychological significance of collective autonomy, I propose that group members will be more likely to strive for group empowerment and challenge the status quo of the existing social system through collective action when they lack, rather than have, collective autonomy. In Manuscript 1, across five samples, I provide correlational and experimental evidence documenting the important consequences of collective autonomy for group members' personal autonomy and psychological well-being. These associations were robust across individualistic (Western-based) and

collectivistic (Eastern-based) cultures. Moreover, these associations remained intact while controlling for several potentially overlapping variables previously described within social identity theory and self-determination theory. In Manuscript 2, across 4 studies, I provide correlational and experimental evidence demonstrating that low-power groups who have their collective autonomy restricted (*vs.* supported) by a high-power outgroup are more likely to pursue power for their group, are more likely to support and engage in collective action, and are more likely to challenge their social system. These associations remained intact even when controlling for other factors previously considered by research on collective action and system justification. Moreover, experiencing a lack of collective autonomy had a unique role in motivating group members to collectively attempt to improve their group's position, regardless of whether group members were treated equally or unequally by the high-power group. Together, the findings documented in these two manuscripts provide compelling evidence for the need that group members have to attain and maintain their collective autonomy. This thesis thereby elucidates the two sides of collective autonomy for disadvantaged group members. Having their collective autonomy supported, rather than restricted, by the high-power group promotes low-power group members to satisfy their psychological need for personal autonomy and experience psychological well-being. Yet at the same time, having their collective autonomy supported, rather than restricted, by the high-power group, might reduce low-power group members' motivation to collectively challenge the very high-power outgroup that otherwise might disadvantage their ingroup.

RESUMÉ

Les sentiments d'être personnellement autonome et d'agir volontairement sont universellement associés au bien-être et à la vitalité psychologiques (Ryan et Deci, 2017). Une tradition de recherche considérable a déjà examiné certains facteurs qui facilitent ou qui entravent l'autonomie personnelle des individus, un besoin psychologique fondamental. Cette recherche considère l'autonomie personnelle dans le contexte de facteurs proches de l'individu, tels que les relations personnelles que l'on partage avec les membres importants de ses groupes sociaux (p. ex. parents, enseignants, médecins); ainsi que dans le contexte de facteurs plus diffus tels que les valeurs et structures de ses endogroupes culturels et politiques. Cependant, aucune recherche jusqu'à date n'a étudié l'impact, sur l'autonomie personnelle, de ressentir que les groupes sociaux auxquels on appartient jouissent *d'autonomie collective* dans un *contexte intergroupe.* Le programme de recherche faisant l'objet de la présente thèse introduit le concept de l'autonomie collective, soit la perception subjective d'un individu que le groupe auquel il/elle appartient est libre de déterminer et de pratiquer sa propre identité culturelle, sans l'influence indue d'autres groupes dans la société. Par l'intégration de la théorie de l'identité sociale (Tajfel et Turner, 1979; Taylor, 2002) et de la théorie de l'autodétermination (Ryan et Deci, 2017), je propose que le sentiment d'autonomie collective mène au sentiment d'autonomie personnelle et, par conséquent, accroît le bien-être psychologique de l'individu qui en fait l'expérience. De plus, compte tenu de l'importance psychologique de l'autonomie collective, j'avance que les individus qui en perçoivent l'absence pour leur groupe social devraient être plus enclins que ceux qui en jouissent à lutter pour augmenter le pouvoir de leur endogroupe et à recourir à l'action collective pour défier le statu quo de leur système social. Sur cinq échantillons, le Manuscrit 1 démontre les conséquences importantes de l'autonomie collective sur l'autonomie personnelle et le bien-être

psychologique des membres d'un groupe social, à l'aide de données corrélationnelles et expérimentales. Ces associations demeurent robustes tant pour les cultures individualistes (occidentales) que collectivistes (orientales). De plus, ces associations demeurent intactes lorsque l'on tient compte de potentielles variables chevauchantes déjà étudiées dans le contexte des théories de l'identité sociale et de l'autodétermination. Dans le Manuscrit 2, quatre études démontrent, à l'aide de données corrélationnelles et expérimentales, que les membres d'un groupe de bas pouvoir dont l'autonomie collective est restreinte (*vs* soutenue) par un groupe de haut pouvoir, sont plus enclins à tenter d'accroître le pouvoir de leur groupe, à soutenir et à participer à l'action collective, et à défier leur système social. Ces associations demeurent intactes même en tenant compte d'autres facteurs précédemment étudiés dans le cadre de recherches sur l'action collective et la justification du système. De plus, l'absence perçue d'autonomie collective motive les membres de groupes sociaux à tenter collectivement d'améliorer la situation de leur groupe, indépendamment du traitement équitable ou inéquitable des membres de l'endogroupe par les membres de l'exogroupe de haut pouvoir. L'ensemble des résultats décrits dans ces deux manuscrits constitue une preuve convaincante que les membres de groupes sociaux ont besoin d'obtenir et de maintenir leur autonomie collective. La présente thèse élucide ainsi les deux facettes de l'autonomie collective pour les membres de groupes désavantagés. D'une part, le sentiment que l'autonomie collective de leur groupe est soutenue par l'exogroupe de haut pouvoir satisfait, chez les membres de l'endogroupe de bas pouvoir, le besoin psychologique d'autonomie personnelle, et contribue à leur bien-être psychologique. Cependant, pour les membres d'un groupe de bas pouvoir, le sentiment qu'un exogroupe de haut pouvoir soutient l'autonomie collective de l'endogroupe pourrait réduire leur motivation à défier

collectivement ce même exogroupe qui désavantage potentiellement l'endogroupe d'autres façons.

GENERAL INTRODUCTION

"Freedom is the oxygen of the soul."

Moshe Dayan

"*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

"Black Power is giving power to people who have not had power to determine their destiny."

Huey P. Newton

Regardless of age, gender, or cultural background, individuals have a basic psychological need to feel personally autonomous. People seek to be the authors of their own identity – to feel that it is they themselves who determine the values, life-long aspirations, goals, daily routines, and choices that define who they are and who they become. Moreover, people have a need to feel authentic and volitional in their actions – to feel that their daily behaviors are a direct reflection of their own "true" self and a product of their own chosen free will, rather than the result of external forces. The universal importance that people place on personal autonomy is reflected in the words of philosophers, songwriters, and world leaders. Even those who have never watched a Shakespearian play have likely heard the line: "This above all: to thine own self be true". Similarly, even those whose only exposure to Frank Sinatra came in the early morning hours at a karaoke bar have likely heard the famous crooner (or a poor imitator) belt out the phrase: "I did it

my way". Yet capturing the psychological essentiality of personal autonomy perhaps most simply and poignantly was former Israeli Minister of Defense Moshe Dayan, who aptly stated: "Freedom is the oxygen of the soul".

Beyond its prevalence within the ethos of popular culture, the concept of personal autonomy has also been the central focus of substantial psychological theory and research. Over forty years of research stemming from the theoretical framework of self-determination theory (Deci & Ryan, 2000; Ryan & Deci, 2000a; Ryan & Deci, 2017), a meta-theory of human motivation and psychological well-being, provides empirical evidence that feeling personally autonomous is a universal psychological need with profound implications for one's well-being. Universally across different cultures, it has been repeatedly shown that feeling personally autonomous, rather than unduly controlled by others, is critical for experiencing optimal psychological and physical well-being (Chirkov, Ryan, & Sheldon, 2011). Furthermore, feeling personally autonomous is not *only* a critical need for members of society's most privileged groups: Personal autonomy uniquely predicts well-being even among disadvantaged individuals whose physical and financial security is continually under threat, and who may be deprived of other basic necessities such as food and shelter (Chen et al., 2015).

Given the profound and universal impact of personal autonomy on well-being, it is critical to address the following question: What factors are essential for people to feel personally autonomous and volitional. It is this basic question that is the starting point of the present thesis.

When we ask ourselves the question "Am I autonomous?" we might first think of ourselves within the context of important interpersonal relationships. For example, we might consider the relationship that we have with our parents, teachers, coaches, doctors, and employers. These individuals have a significant role in our lives and in our personal

development. Yet often, these individuals may also have the power to have influence over us, and potentially control us. For example, they may provide us direction in an autonomy-supportive manner by helping us to understand the value of their directives, and by respecting our decision to ultimately choose to follow or *not* to follow their guidance. However, they may also try to force us into following their directives with the use of rewards and punishments. Importantly, the extent to which we feel that our personal autonomy is supported rather than thwarted by such important authority figures has a profound impact on our psychological well-being (Ryan & Deci, 2017). In this regard, an important starting point of self-determination theory has been to examine the nature and consequences of personal autonomy support within the context of such interpersonal relationships (Ryan & Deci, 2000a). Specifically, Ryan and Deci (2000a) assert that, to understand how one's need for autonomy may be thwarted, we must turn first to "[…] individuals' immediate social contexts and then their developmental environments" (*p.* 74).

In the present thesis, I echo the essential role that receiving personal autonomy support has for one's capacity to satisfy their psychological need to feel personally autonomous. However, I introduce the concept of collective autonomy, and the idea that people's sense of personal autonomy is also impacted by their perception of their social group's autonomy within an *intergroup context*. My theoretical position is informed by social identity theory (Tajfel & Turner, 1979; Taylor, 1997, 2002), which argues that part of an individual's construal of their self-concept is derived from their perceptions of their social groups and the social identity associated with those groups. Thus, I shift my focus away from the issue of personal autonomy support within the context of interpersonal relationships and, rather, I focus attention on an issue that has yet to be considered by SDT or social psychology more broadly: C*ollective autonomy.*

Informed by how personal autonomy has been defined at the individual level (Ryan & Deci, 2017), I define *collective autonomy* as group members' subjective perception that their social group can freely determine its own social identity, culture, and collective actions, without being unduly controlled by other groups in society. Experiencing collective autonomy, or a lack of collective autonomy, is as ubiquitous as is experiencing personal autonomy support. Whether consciously or subconsciously, every time we wake up in the morning and feel that we are free to choose to put on clothes that are normative and representative of our cultural group, we experience what it means to have collective autonomy. Every time we have a large family dinner and feel free to indulge in our grandparents' traditional old recipes, we experience what it means to have collective autonomy. Every time we feel that we are free to go to our chosen place of worship, and celebrate our own national or religious holidays, we experience what it means to have collective autonomy. Every time we feel that we are free to choose to name our children in a way that has meaningful significance to our own cultural or ethnic group, we experience what it means to have collective autonomy, and every time we feel that we are free to speak our own language if we so desire, we experience what it means to have collective autonomy.

When one's group has collective autonomy, group members may not always be cognizant of the profound implications that having collective autonomy has for their daily behavior and experiences. Wearing the prototypical clothing of one's cultural group, eating traditional cultural food, and speaking one's own cultural language: For individuals with collective autonomy engaging in such behaviours may occur routinely, automatically, and unconsciously.

Yet imagine that your group lacks collective autonomy – that you cannot choose to wear the clothes of your own cultural group, to eat your own food, to speak your own language. For members of groups that lack collective autonomy in society – struggling to regain the freedom to

engage in such behaviors may be a central part of their daily realities. For example, Indigenous peoples in North America have long sought to regain the freedom to practice their traditional cultural customs, self-govern the manner in which their children are educated, and speak their own language (Taylor, 2002; Taylor & de la Sablonnière, 2014; Taylor & Kachanoff, 2015). As well, many ethnic minorities outside of North America have similarly been deprived of their collective autonomy. In Turkey, for example, members of the Kurdish ethnic minority have historically been prevented from practicing their own culture in Turkish society, facing imprisonment and torture for writing and speaking their own language publicly or for giving their children Kurdish names (Baran, 1986; Gunes, 2013). Even where multiculturalism and diversity are generally valued and celebrated, the collective autonomy of certain groups may be importantly restricted. For example, although Canada is widely recognized to have strong multicultural values (Guimond et al., 2013), the Canadian province of Quebec proposed legislation to ban members of religious minorities from wearing religious symbols in government and para-public buildings (Flanagan, 2014). Similarly, France, which has also been viewed as a multi-cultural nation, has put into effect laws that restrict members of certain religious minorities from openly expressing their culture in society (Adrian, 2015; Ramirez, 2014).

Thus, from these examples, it is clear that not all groups in society have been able to maintain their collective autonomy. Through processes such as slavery, forceful assimilation, and laws that place restrictions on what cultural practices are permissible in society, many groups have been deprived of their collective autonomy either previously in their group's history or presently. Indeed, amidst a globalizing world that is rapidly becoming more diverse, issues of collective autonomy may be especially salient. For example, issues of collective autonomy are at the heart of the ongoing reasonable accommodation debates between the 59.5 million migrants

presently displaced abroad, and the nations who are receiving them (UNHCR, Global Trends Report, 2016). At stake in these contexts is the collective autonomy of both groups. Migrants are struggling to maintain their freedom to be able to continue to practice their heritage culture once in their new home, if they so please. Yet at the same time, receiving group members are concerned about their freedom to have the final say as to what cultural practices and values will remain normative and definitive of their own national identity.

Within all of these complex intergroup contexts however, I contend that lacking collective autonomy may be a defining aspect of a group member's personal experience, personal identity and, ultimately, their personal sense of autonomy. Yet, despite the daily implications that having collective autonomy (or a lack there of) has for individual group members, no empirical research has studied the psychology of collective autonomy. Thus, it remains unclear what impact perceptions of collective autonomy may have for individual group members directly, or for intergroup relations more broadly. In conducting this program of research, I set out to address this important gap in the literature. More specifically, I set out to bring the psychology of intergroup relations into the theoretical framework of self-determination theory. At the same time, I set out to bring the psychology of autonomy into the field of intergroup relations and the theoretical framework of social identity theory.

Central to my theorizing, and directly addressing the question of "what factors are essential for people to feel personally autonomous and volitional" is the following core hypothesis: The extent to which individuals feel personally autonomous as individuals is, in part, directly impacted by their perception that their group has collective autonomy within an intergroup context. This hypothesis emerges by integrating the theoretical framework of self-determination theory with social identity theory: Specifically, I reason that because individuals

derive their sense of self in part from their social identity, individuals will feel a diminished sense of personal autonomy if they feel that their social groups lack collective autonomy as a group. This idea was captured poignantly by Nelson Mandela when he described his and his fellow South Africans' experiences of Apartheid: "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".

Using this initial hypothesis as a platform, I then examine the potential downstream consequences of perceiving or not perceiving collective autonomy, both for individual group members and intergroup relations. First, I examine how perceptions of collective autonomy impact group members' psychological well-being. There is a wealth of evidence indicating that people's basic psychological need to feel personally autonomous is positively associated with psychological well-being. Thus, I reason that, if collective autonomy directly impacts personal autonomy, collective autonomy may also have an indirect effect on well-being through personal autonomy. Secondly, with respect to the implications of collective autonomy for intergroup relations, I examine how perceptions of collective autonomy may contribute to low-power group members' desire to pursue group power, challenge their social system, and to engage in potentially violent collective action. I argue that, because feeling collectively autonomous has important consequences for group members' psychological-need satisfaction and well-being, group members may collectively push to increase their group's power in order to restore their collective autonomy when it becomes threatened.

In this thesis, I propose and test multiple different hypotheses, involving a diverse array of outcomes. However, underlying each hypothesis is one unifying objective: To introduce collective autonomy as a novel and distinct construct with important implications for the

outcomes considered both by self-determination theory (i.e., personal autonomy, well-being) and intergroup relations (i.e., collective action support, desire for group power, and system justification).

I begin by applying self-determination theory in order to define and operationalize collective autonomy more formally. Next, I briefly review the theoretical literature concerning group self-determination within the domains of international law, human rights, and political philosophy. There is little empirical research addressing the issue of collective autonomy within the domain of psychology. However, issues of group self-determination are central within the domains of law and political philosophy. Through reviewing this research I aim to highlight the real-world psychological implications and relevance of collective autonomy for group members. Furthermore, the hypotheses that I test empirically in the present thesis have been discussed at a theoretical level within the political-philosophy literature. Thus, the political and philosophical literature informed my hypotheses beyond what is available within the psychological literature.

Following my review of the political and philosophical literature, I formally describe my overarching hypothesis that collective autonomy impacts personal autonomy. In this regard I will apply social identity theory as a guiding theoretical framework (Tajfel & Turner, 1979; Tajfel & Turner, 1986; Turner et al., 1987). I then briefly describe my rationale for how collective autonomy may impact the psychological well-being of individual group members, and intergroup relations. I follow this section with a description of how collective autonomy is theoretically different from other potentially overlapping constructs that are critical to both self-determination theory (SDT) and social identity theory (SIT). This will be essential in order to establish collective autonomy as a novel and important construct within the frameworks of SDT and SIT.

The unique implications of collective autonomy for individual group members and intergroup relations are then examined across two manuscripts.

Defining Collective Autonomy

Since I am introducing a new concept, collective autonomy, it is important that it be defined and contextualized clearly. My concept of collective autonomy does not arise in a vacuum, but rather builds on the rich tradition of theory and research focused on the psychological importance of personal autonomy. There is an extensive literature concerning *personal autonomy* at the individual level that informs my conceptualization of collective autonomy at the group level. Central to this research is self-determination theory (SDT; Deci & Ryan, 1985a; Deci & Ryan, 2000; Deci & Ryan, 2008). At the individual level, personal autonomy involves feeling free to determine one's own values, behaviors, and goals. Equally, personal autonomy involves a sense of volition and feeling motivated and driven by one's true self, rather than by external pressures and controls (Deci & Ryan, 2000; Chirkov, et al., 2003; Sheldon, 2014). A person's sense of personal autonomy is influenced in part by the extent to which they feel that other people support their autonomy, or conversely, are attempting to control and pressure them (Deci & Ryan, 1985b; Ryan & Deci, 2000b). For example, exposure to external rewards (Deci, 1971; Deci, 1972; Deci, Koestner & Ryan, 1999; Lepper, Greene, & Nisbett, 1973), surveillance (Lepper & Greene, 1975), imposing deadlines (Amabile, DeJong, & Lepper, 1976), and pressured competition (Reeve & Deci, 1996) may reduce an individual's sense of personal autonomy.

At the group level, I define collective autonomy as a group member's subjective perception that their social group has the freedom to determine its own social identity and group culture, and all of the values, norms, shared goals, customs, and practices that are nested within

that identity and culture. In this way, collective autonomy involves people feeling that their ingroup has not been unduly influenced, pressured or controlled by other outgroups within an intergroup context that is relevant and salient to their ingroup. Equally, collective autonomy involves group members feeling that they are free in society to openly practice their group's culture and to behave in accordance with their own social identity, should they so choose. Beyond issues pertaining directly to group members' freedom to define and practice their own culture, collective autonomy also involves group members feeling that their group is free to determine its collective actions and decisions in society.

Several different intergroup contexts may lead group members to perceive a lack of collective autonomy. Group members may perceive a lack of collective autonomy when their ingroup is affected by controlling intergroup processes such as economic sanctions, military conquest, forceful assimilation, colonization, and slavery. In these circumstances, group members may be forced to adopt customs, practices, or values that were not originally part of their own group's culture. As well, group members may be prevented from acting in accordance with their own group's culture by laws and regulations imposed upon them by other groups. For example, when group members immigrate to a new cultural context, they may feel pressured to conform to the cultural practices and customs that are prescribed by their new culture, and that they are not encouraged, or indeed welcome, to follow the practices and customs of their culture of origin.

It is important to highlight that the groups that lack collective autonomy are also the groups that tend to have relatively little *group power* in their society. Group power involves a group's capacity to have influence and control over the structure of its society, and the other groups in their society (Cartwright & Zander, 1968; Ng, 1980). As well, power involves a group's capacity

to remain relatively independent and free from the influence of other groups (Keltner, Gruenfeld, & Anderson, 2003; Pratto, 2016; Pratto, Pearson, Lee, & Saguy, 2008). As a function of their relative independence from other groups, high-power groups tend to be less likely to fall under the undue influence and control of other groups (i.e., a lack of collective autonomy). Rather, they can remain free to behave according to their chosen norms and practices (i.e., to satisfy their own need for collective autonomy). Conversely, because of their relative dependence on the high-power group, groups that lack power are subject to the potential control of high-power groups, and are at risk of having their collective autonomy undermined by the high-power group.

Yet despite the important impact that group power has on group members' capacity to maintain their collective autonomy, the two constructs are distinct: Being of low power and experiencing a lack of collective autonomy are not synonymous. To date, substantial SDT research has documented that, within interpersonal contexts, it is possible for high-power individuals (e.g. doctors, parents, teachers, bosses) to *support* the personal autonomy of lower-power individuals (patients, children, students, employees; Niemiec et al., 2006; Reeve, 2006; Williams et al., 1996). Such personal autonomy support from one person to another involves acknowledging each other's personal choices and opinions, and not trying to unduly pressure or control each other with the use of external rewards, deterrents, and contingencies (Deci & Ryan, 1985b; Deci & Ryan, 1987; Niemiec, et al., 2006; Ryan & Deci, 2000b; Williams, Grow, Freedman, Ryan, & Deci, 1996). I argue that the same holds true at the intergroup level: High-power groups may support the *collective autonomy* of the low-power group by giving members of the low-power group the space and the freedom to determine and practice their own culture. For example, while I have described instances of certain ethnic minorities being denied the freedom to practice their cultural customs openly in society (e.g., Muslims in France), many

ethnic minorities are free to choose to practice their culture openly in society: The "Little Italys", "Little Indias", and "Chinatowns" that exist within many major North American cities exemplify ethnic minorities having the freedom to practice and celebrate their own distinctive cultural practices openly within their larger North American society.

In the present thesis, I argue that one essential function of group power is that it allows groups to maintain and protect their collective autonomy: It is in part because of this important function of group power that groups may desire maintaining a relatively high level of power in their society. Within interpersonal contexts, there is robust evidence that people may desire personal power in order to maintain and protect their personal autonomy. In a series of nine studies by Lammers, Stoker, Rink, and Galinsky (2016), it was found that low-power individuals desired having more personal power within their interpersonal relationships when they lacked (rather than had) personal autonomy as a result of their low-power position. Intriguingly, when low-power individuals lacked influence over others, they did not necessarily desire more power. Indeed, if individuals lacked influence but maintained their personal autonomy, they did *not* desire more personal power. Thus, at the interpersonal level, it is clear that personal power and personal autonomy are distinct constructs. Moreover, individuals may desire personal power primarily as a means for ensuring their own personal autonomy, rather than desiring power as a means of influencing other people. Similarly, at the group level, I argue that groups may desire power because of its role in allowing them to maintain their collective autonomy. Speaking to this idea was one of the former leaders of the Black Power Movement, Huey P. Newton who stated: "Black Power is giving power to people who have not had power to determine their destiny". For Newton, power for Black Americans was essential because it would allow Black

Americans to restore their collective autonomy as a people within American society (Newton, 1980).

It is also important to note that I conceptualize collective autonomy as a *subjective* evaluation that *individual* group members make of their group within an intergroup context. Thus, the perception of collective autonomy held by any one individual group member is not necessarily an accurate reflection of the extent to which the group objectively has collective autonomy within an intergroup context. Nor is any one individual group member's perception of collective autonomy necessarily representative of the perceptions of other individual group members. On this basis, collective autonomy is an *individual attribute* rather than what can be defined as group attribute or group belief (see, Bar-Tal, 1990, for review). Therefore, it is *not* necessary that the conceptualization and measurement of collective autonomy meet Bar-Tal's (1990) requirements for a group construct or group belief. These requirements stipulate that: (1) the construct reflects the group as a whole, (2) that group members have similar perceptions of the construct, (3) that the construct can be used to differentiate between groups, and (4) that the construct reflects processes that occur within the group.

At the same time however, I argue that it is possible, and also likely, that group members' perception of collective autonomy is relatively consistent with that of their fellow group members. This may be especially true under social contexts in which another outgroup has actively attempted to control the ingroup or circumvent ingroup members from practicing their own social identity. Within these contexts, the threat to collective autonomy faced by the group might be especially salient to all group members, resulting in a shared sense of collective autonomy threat being experienced by most members of the group. In this thesis, an attempt is made to systematically induce threats to an entire group's collective autonomy. Within such

contexts, I can then determine the extent to which group members' perception of collective autonomy is inter-correlated with their fellow group members. I expect that group members' own perception of collective autonomy will be inter-related with the collective autonomy perceptions of their fellow group members. Indeed, as is expressed within Mandela's description of Apartheid, lacking collective autonomy is a reality that is intimately shared by members within a group, and is a common collective fate that binds group members together (Mandela, 1995).

Insights from Political Philosophy and International Law

Issues of collective autonomy have been at the forefront of political discourse concerning basic human rights, and have received much attention within the domains of international law and political philosophy (Margalit & Raz, 1990). Woodrow Wilson was one of the first to argue that self-determination should be considered an international right of all peoples and introduced the term in 1918 (Kirgis, 1994). Following Wilson's proposition it was officially recognized by the United Nations, that all nations, and groups of peoples within nations, should have the right to freely self-determine their own collective identity and their own actions as a group (Kirgis, 1994; see, Charter of the United Nations, 1945; ICESCR, 1966).

Yet despite political theorists recognizing the significance of both personal autonomy and collective autonomy, there is frequent debate as to the exact legal definition of self-determination and which groups or 'peoples' in society should be entitled to have the *right* to self-determination (Margalit & Raz, 1990). As a result, many groups of people have remained deprived of their right to self-determination. This includes groups of Indigenous (Aboriginal) peoples whom have yet to legally and officially realize self-determination for their group (e.g. Corntassel, 2008). Furthermore, the bloody conflicts presently ongoing in Syria, Somalia, and the Ukraine in part stem from groups trying to establish self-determination. These political and

physical battles provide grim credence to Robert Lansing's pessimistic views on self-determination: "Loaded with dynamite […] it will raise hopes which can never be realized. It will, I fear, cost thousands of lives. In the end it is bound to be discredited, to be called the dream of an idealist" (Lansing, 1921, c.f. Philpott, 1995). I argue that this attention paid to issues of self-determination by international policy makers, and the relevance of self-determination to real world intergroup relations, is indicative of the real-world significance of collective autonomy to the individual and to intergroup relations.

Within the domain of political philosophy, concrete hypotheses as to the psychological impact of collective autonomy on individuals have been proposed (Kymlicka, 1989; Kymlicka, 1996; Murphy, 2014; Tamir, 1991). Political philosopher Will Kymlicka has argued that the capacity for group members to feel *personally* free and autonomous is in part affected by their perception of their group's collective autonomy. According to Kymlicka, the personal choices that individual group members make are made within the context of their culture. On this basis, he further argues that, if groups cannot self-determine their own culture, group members will have no framework with which to articulate their own personal identity and no framework on which to base their own personal decisions (see, Lea, 2000 for review). For example, Lea (2000) argues:

> [Kymlicka] claimed that a viable community is essential for providing a cultural context of choice in which autonomy is possible […] Kymlicka's formulation thus brings together two concepts, that of autonomy with respect to individual agency, and autonomy as applied to the group in its independence from the dominant cultural community; and the latter is necessarily supportive of the former" (Lea, 2000, p. 1).

In this regard, Kymlicka's theorizing is concordant with my hypothesis that an individual group

member's perception of personal autonomy will be directly impacted by his or her group's collective autonomy.

Some scholars have proposed that group members may even be willing to sacrifice their own personal autonomy in order for their group to attain or maintain its collective autonomy (Berlin, 1969; c.f. Klabbers, 2006). This proposition is most notably attributed to the philosopher Isaiah Berlin who remarked that "people would rather be ruled by a dictator from their midst than by some cautious, just, gentle, well-meaning administrator from the outside" (Berlin, 1965; quoted from Klabbers, 2006, p. 187). Echoing Kymlicka, Berlin argues that group autonomy is essential for humans to feel free as individuals. For example, in reviewing Berlin's theory, Klabbers describes that for Berlin: "being governed by the outside would imply being less than fully free and, therewith, being less than fully human" (p. 187). Beyond its necessity for personal freedom, it has been argued that the capacity of groups to self-determine their own destiny and identity may impact the overall wellbeing of group members (Murphy, 2014). At the extreme, it has even been proposed that having collective autonomy is necessary for a group to maintain its very existence as a distinct social group in society (Tamir, 1991).

While the potential psychological consequences of collective autonomy have been discussed at length within the domain of political philosophy, there is no theorizing or empirical research within the psychological literature that has directly tested the psychological consequences of collective autonomy for the individual. The present thesis addresses this gap in the literature by proposing a theoretical psychological framework for understanding the potential psychological consequences of perceiving collective autonomy.

The Link between Collective Autonomy and Personal Autonomy

The starting point for the present thesis is the hypothesis that a group member's subjective perception of collective autonomy is linked to his or her own personal sense of autonomy. Linking a collective process (i.e., collective autonomy) to an individual process (i.e., individual autonomy) is not unique to my theoretical framework. Research centered within the framework of social identity theory (Tajfel & Turner, 1979, 1986) provides compelling evidence that the manner in which people articulate, define, and evaluate their self-concept, is influenced by their membership in social groups and by their perception of their group in an intergroup context (e.g. Tajfel & Turner, 1979, 1986; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987; Taylor, 1997, 2002; Oyserman, 2007, 2009; Usborne & Taylor, 2010, 2012). Social identity is defined as an individual's "knowledge that he belongs to certain social groups together with some emotional and value significance to him of his group membership (Tajfel, 1978, p.63). In the following section, I briefly review previous research concerning the impact of social identity for the individual. I then use this literature as a platform to propose a link between collective autonomy and personal autonomy.

The knowledge that group members have concerning their social groups has a profound impact on how group members articulate and define their overall sense of self, or self-concept (Haslam, Jetten, Postmes, & Haslam, 2009; Taylor, 1997, 2002; Usborne & Taylor, 2010, 2012). As well, social identity may impact the actual daily behaviours of group members (Oyserman, 2007, 2009). Taylor (1997, 2002) has theorized that group members articulate their self-concept on the basis of their social identity. Taylor proposes that, contained within one's social identity is a road map that specifies the behaviours, values, customs, practices, and roles that are normative within one's group. By having a clear definition of what it means to be a group member, group

members are provided with a normative framework with which to articulate their own personal identity (Taylor, 2002). More specifically, having a clearly defined social identity allows a group member to make relative comparisons between themselves and other group members, in order to know how one is similar to and different from other group members. Importantly, even when group members do not choose to follow the norms of their group, this process of relative comparisons provides the individual with vital information with which to make sense of one's self personally. Providing empirical support for this model, the extent to which individuals have a clearly defined social identity is found to relate to them having a clearly defined self-concept (Usborne & Taylor, 2010, 2012). Thus, it appears that, in order for group members to know who they are as individuals, they must first have a clear understanding of who they are collectively as a group.

Social identity also impacts the motives and behaviours of individual group members. People tend to have behavioral intentions that are concordant with what they perceive as being normative within their group (Terry & Hogg, 1996; Terry, Hogg & White, 1999). More broadly, Oyserman (2007, 2009) has proposed an identity-based theory of motivation, which stipulates that people are "motivated to pursue the goals ingroup members pursue using the means ingroup members use" (Oyserman, 2007, p.432). Providing evidence for this model, Oyseman has shown a link between people's social identity and their actual behaviours across multiple domains. For example, social identity has been associated with group members' dietary habits and engagement in physical exercise (Oyserman, Fryberg, & Yoder, 2007), behaviours which are adaptive for achieving academic success (Oyserman, Bybee, & Terry, 2006), behaviours which are mal-adaptive for achieving academic success (Oyserman, Brickman, Bybee, & Celious, 2006), and people's long-term aspirations (Fryberg, Markus, Oyserman, & Stone, 2008). In sum, there is

robust evidence that social identity has a profound impact on the motives that drive individual group members' daily behaviour, and ultimately, actual behavior.

Social identity theory also proposes that individuals may evaluate their own personal self-worth or self-esteem in part from how positively they view their social groups relative to other social groups (Tajfel & Turner, 1979). This hypothesis is referred to as the self-esteem hypothesis within social identity theory (e.g., Crocker, Luhtanen, Blaine & Broadnax, 1994; Hogg & Abrams, 1990; Luhtanen & Crocker, 1992; Oakes & Turner, 1980; Rubin & Hewstone, 1998; Turner, 1982; Turner, Brown & Tajfel, 1979). It is on the basis of this hypothesis that social identity theory has sought to explain why group members may show a positive bias towards their own ingroup, and may even discriminate towards outgroups. Specifically, SIT argues that having an ingroup bias towards one's own ingroup serves the function of maintaining a relatively positive image of their own ingroup and, in turn, enhancing one's own self-image (Tajfel & Turner, 1979; Crocker & Luhtanen, 1990).

Thus far, social identity theory has focused on *self-esteem* as the primary psychological mechanism through which a group member's perception of their social identity might impact their own self-perception and self-evaluation. Put simply, the theory has argued that group members must answer the question of "are we worthy?" in order to then answer the question of "am I worthy?" In the present thesis, I propose that the psychology of *autonomy* may also be an important psychological mechanism through which group members' perceptions of their group in an intergroup context can impact their own self-perceptions. Specifically, I argue that by answering the question "are we free?" group members can then answer the question "am I free?"

As I have reviewed, social identity theory provides robust evidence to suggest that people's values, long-term goals, aspirations, behaviors, and overall sense of self are derived in

part from their social identity. Thus, on this basis, I argue that, if so much of who we are personally stems from our social identity, then it follows theoretically that our personal sense of autonomy may be contingent in part on our perception that our social groups have collective autonomy in society. Imagine being a member of a group that lacks the freedom to determine its own culture, or the freedom to choose whether or not to practice its own culture. Imagine that the laws of your society prevent you from being able to choose to wear the clothes that are customary within your culture or religion, to name your children as you please, or to speak the language of your own group. I propose that lacking collective autonomy in these respects will have detrimental consequences for one's own personal sense of autonomy. Therefore, in the spirit of Mandela (1995), I argue that when a people are shackled collectively, individual members within the group will internalize those shackles personally, and feel that their personal sense of autonomy has been compromised.

Downstream Consequences of Collective Autonomy

The present thesis also examines the downstream consequences of collective autonomy on individual group members' psychological well-being, and on important outcomes related to intergroup relations (group's desire for power, system justification, and collective action). The underlying theoretical rationale for examining the relation between collective autonomy and these outcomes is described briefly here, and in detail in Manuscript 1 (psychological well-being) and Manuscript 2 (desire for power, system justification, and collective action).

Psychological well-being. Self-determination theory provides extensive evidence that psychological well-being is impacted by the extent to which individuals feel personally autonomous (Chirkov & Ryan, 2001; Deci, et al., 2001; Reis, Sheldon, Gable, Roscoe & Ryan, 2000; Ryan & Deci, 2000a; Vansteenkiste, Ryan & Deci, 2008; see, Chirkov, Sheldon & Ryan,

2011, for review). Extending this line of research, I hypothesize that collective autonomy will impact a group member's psychological well-being. Importantly however, I predict that the relation between collective autonomy and psychological well-being will be fully mediated by the effect of collective autonomy on personal autonomy. When group members feel a lack of collective autonomy, their own personal sense of autonomy will be undermined. This lack of personal autonomy will, in turn, have negative consequences for their psychological well-being. Traditional social identity models have primarily focused on personal self-esteem as the psychological mechanism underlying the relation between maintaining a positive social identity and psychological well-being (Abrams & Hogg, 1990; Turner, et al., 1979; Turner, 1982; Oakes & Turner, 1980). Indeed, threats to group status, group power, or group value might contribute negatively to one's social identity and, in turn, negatively impact self-esteem (see, Branscombe, Ellemers, Spears, & Doosje, 1999, for review). In the present thesis, I aim to show that, beyond these influential factors, collective autonomy may also have important implications for psychological well-being.

Intergroup relations. The present thesis also investigates the potential consequences of collective autonomy for the relations between low-power and high-power groups. This is an especially important issue given that the vast majority of real-world conflicts occurring either between nations or within nations involve groups of unequal power. Specifically, I investigate how collective autonomy threats may mobilize the collective action initiatives of low-power groups. Paradoxically, there is robust evidence to suggest that groups that are of relatively low power in their society are often reluctant to engage in collective action in order to improve their group's power position. Furthermore, low-power groups may even justify the very social system that disadvantages their group (Jackman, 1994; Jost, Banaji, & Nosek, 2004; Van Zomeren,

Postmes, & Spears, 2008). Substantial research has thus investigated under what conditions low-power groups might actually support and engage in collective action, which range from signing petitions and publically vocalizing discontent, to mass social protest, riots, and even civil war. This previous research has focused primarily on realistic threats to group members' scarce resources (see Van Zomeren, et al., 2008). Specifically, it is found that when low-power group members feel that they have been unjustly deprived of scarce resources, or exploited by the high-power group, they may be more likely to engage in collective action initiatives (Crosby, 1982; Pettigrew et al., 2008; Runciman, 1966; Walker & Smith, 2002, Van Zomeren et al., 2008).

In this thesis, I aim to expand upon the collective action literature by investigating, for the first time, how having collective autonomy, or a lack of collective autonomy, might impact group members' desire to engage in collective action. I propose that group members may desire having group power because group power allows them to attain or maintain their group's collective autonomy. If collective autonomy is indeed essential for group members to experience personal autonomy and psychological well-being, then group members who lack autonomy may be especially motivated to restore their group's collective autonomy, at all costs. Thus, when low-power group members have their collective autonomy threatened, rather than supported, by a high-power outgroup, they may become especially motivated to restore their group's power in order to restore their collective autonomy. Providing support for this hypothesis is research at the interpersonal level indicating that low-power individuals will be especially more motivated to increase their personal power when they lack personal autonomy because of their low-power position (Lammers et al., 2016). This idea is tested in Manuscript 2.

Differentiating Collective Autonomy from Potentially Overlapping Constructs

The overarching objective of this thesis is to introduce collective autonomy as a novel construct within the theoretical frameworks of self-determination theory and social identity theory. As such, it is important to differentiate collective autonomy from a series of other potentially overlapping important constructs that are already established in the literature relevant to both frameworks. In this section, I provide a theoretical rationale for why collective autonomy may be distinct from each of these constructs. These variables are then controlled for across the different studies presented in this thesis.

Potentially overlapping constructs within self-determination theory. With respect to concepts that are central to SDT, I make the distinction between collective autonomy and (1) the personal autonomy support that group members may receive from other ingroup members (Deci & Ryan, 1987; Ryan & Deci, 2000a; Williams, et al., 1996), and (2) the types of autonomous versus controlled reasons that group members may have for practicing their culture (Chirkov, et al., 2003; Downie, Koestner, & Chua, 2007; Downie, Koestner, ElGeledi, & Cree, 2004; Thomas, Amiot, Louis, & Goddard, 2017).

Collective autonomy and personal autonomy support. A group member's perception of collective autonomy is different from the amount of personal autonomy support a person perceives during day-to-day social interactions. Group members perceive autonomy support when they feel that other people within their group provide them with choices and options, take their perspective, and respect their values and decisions (e.g. Niemiec et al., 2006; Skinner & Belmont, 1993; Williams, et al., 1996). At a macro level, individuals may also feel that their personal autonomy is supported to varying degrees *within* their social group depending on the social structure of their group. For example, groups with vertical structures that emphasize

control and submission to authority may be less conducive to supporting the individual autonomy of group members as opposed to groups with horizontal structures that emphasize equality (Chirkov, et al., 2003; Downie, et al., 2004; Downie et al., 2007). Previous research has found personal autonomy support to be essential for personal autonomy in interpersonal contexts that are typically of equal power, such as friendships (Deci, La Guardia, Moller, Scheiner, & Ryan, 2006) and romantic relationships (La Guardia & Patrick, 2008); and unequal power, such as relations with one's parents (Niemiec et al., 2006), teachers (Reeve, 2006), doctors (Williams, et al., 1996), and employers (Deci, Connell, & Ryan, 1989). Moreover, within these contexts, receiving personal autonomy support has been shown to have important consequences for group members' well-being.

I propose that it is possible for a person to feel that their social group has collective autonomy in an intergroup context and, at the same time, feel personally pressured and controlled by members of their own group. For example, imagine a group member who feels that her nation is collectively autonomous in determining its culture and is free to practice its culture openly in society (*high collective autonomy*). However, at the same time, this group member feels personally pressured by family members and friends to act in ways that are congruent with that culture (*low intragroup autonomy support*). In this case, the group member would feel collectively autonomous yet, at the same time, feel little autonomy support from other ingroup members. Conversely, a group member may feel that her cultural group has been unduly controlled by other groups (*low collective autonomy*) yet, at the same time, feel that her personal autonomy is being supported by her friends and family (*high intragroup autonomy support*). Importantly, in this case, even though group members receive personal autonomy support from

other ingroup members, they may still feel that their overall sense of personal autonomy is undermined because of their lack of collective autonomy.

Collective autonomy and personal reasons for practicing one's culture. A distinction can also be made between collective autonomy and the types of reasons that group members may have for acting in accordance with their social identity and culture. Formerly, self-determination theory used the term *personal regulatory style* to refer to whether an individual's behavior is driven by relatively autonomous reasons or relatively controlled reasons (Ryan & Deci, 2000b; Chirkov et al., 2003). With respect to cultural identity, group members may act in accordance with their group identity for reasons that are highly autonomous, such as internalizing the value of a given group custom. However, group members may also practice their culture for highly controlled reasons, such as practicing a cultural custom in order to receive a reward or to avoid disappointing others. Consistently, it has been found that having more autonomous rather than controlled reasons for practicing one's culture is associated with greater personal autonomous need satisfaction and greater psychological well-being (Chirkov, et al., 2003; Downie, et al., 2004; Yampolsky & Amiot, 2013).

I argue that it is possible for group members to feel that their group is free to determine and practice its own culture (*high collective autonomy*) yet, at the same time, practice their group's culture for controlled reasons, such as in order to please other members of their group (*controlled regulatory style*). Conversely, group members may value and internalize aspects of their group's culture (*autonomous regulatory style*), despite feeling that their group is not free or welcome to practice these aspects of their group's culture openly in their society (*low collective autonomy*). In these circumstances, having a lack of collective autonomy may undermine group

members' overall sense of personal autonomy, even though group members may have an autonomous personal regulatory style for acting in accordance with their group's culture.

Beyond the personal reasons that group members may have for practicing their culture, Thomas and colleagues (2017) have introduced the concept of *collective self-determination*: Group members' meta-perceptions of the type of reasons that *other* members of their group may have for engaging in normative group behaviours. For example, some Canadians may have the perception that other Canadians tend to enact their cultural customs and practices for relatively autonomous reasons, such as because they value doing so. In contrast, some Canadians may feel that other Canadians practice their culture for relatively controlled reasons, such as because they feel expected to do so, or because of external pressures from an authoritarian leader within the group. Collective self-determination has thus far been studied with respect to the different reasons that group members may have for engaging in intergroup-helping behaviours. Specifically, Thomas and colleagues (2017) have found that when group members feel that other ingroup members engage in intergroup helping because of autonomous rather than controlled reasons (i.e., high collective self-determination), they are more likely to also feel personally autonomous when engaging in intergroup helping.

Importantly, I argue that a theoretical distinction can be made between what I refer to as collective autonomy in the present thesis and what Thomas and colleagues (2017) have referred to as collective self-determination. As I have described, collective autonomy is an *intergroup phenomenon*: Collective autonomy pertains to the perception that other groups permit one's own group, and the members within, to freely determine and practice their own culture. In contrast, collective self-determination is an *intra-group phenomenon*: Collective self-determination pertains to ingroup members' perception of the reasons that other ingroup members may have for

practicing their culture. I argue that it is possible that group members may feel that their fellow group members choose to practice their culture for relatively autonomous reasons (i.e., *high collective self-determination*) yet, at the same time, feel that their group is not free in society to practice their own culture (i.e., *low collective autonomy*). For example, members of ethnic minorities who are not permitted to practice their culture openly in society may still very well feel that other members in their group would value doing so if society permitted them.

Potentially overlapping constructs within social identity theory. With respect to concepts that are central to social identity theory, I make the distinction between collective autonomy and collective agency: A sense of feeling powerful, efficacious, and in control of one's outcomes as a group (Shnabel & Nadler, 2015; SimanTov-Nachlieli & Shnabel, 2014; SimanTov-Nachlieli, Shnabel, & Halabi, 2016a; SimanTov-Nachlieli, Shnabel, & Mori-Hoffman, 2016b). I also differentiate collective autonomy from the general perception that one's group is the target of intergroup prejudice (Branscombe, et al., 1999; Mogghadam & Perault, 1992). Finally, I describe how threats to collective autonomy may differ from other forms of identity-based threats previously described within the intergroup literature: Value threat (Stephan, Renfro, Esses, Stephan, & Martin, 2005; Stephan, Ybarra, & Bachman, 1999; Stephan, Ybarra, Martinez, Schwarzwald, & Tur-Kaspa, 1998), and threats to a group's distinctiveness (Branscombe, Ellemers, Spears, & Doosje, 1999; Tajfeld & Turner, 1979).

Collective autonomy and collective agency. Collective agency is a heterogeneous construct involving a sense of feeling powerful, strong, efficacious, and an internal locus of control as a group (see, Shnabel & Nadler, 2015 for review). Broadly, it has been proposed that group members have a psychological need to feel agentic as a group, which may be threatened especially amongst low-power group members who have been victimized by other groups in

society (Shnabel, Nadler, Ulrich, Dovidio, & Carmi, 2009). There is substantial evidence indicating that threats to collective agency impede reconciliation (SimanTov-Nachleili et al., 2016b) and pro-social behavior (SimanTov-Nachleili et al., 2016a) between groups that have been engaged in long-standing conflicts. Importantly however, I argue that collective autonomy can be differentiated from the different dimensions of collective agency previously described in the intergroup literature, and collective agency as broad construct.

Collective autonomy and power. As I have described, although power and collective autonomy are related, lacking power is not synonymous with lacking collective autonomy. At the interpersonal level, it has been shown that personal autonomy is separate from power, in that it is possible for individuals with relatively low power to maintain their autonomy in asymmetric power relationships (Skinner & Belmont, 1993, Niemiec et al., 2006, Williams, et al., 1996). Moreover, Lammers and colleagues (2016) have demonstrated that low-power individuals who lack influence over other individuals will only desire greater power when their personal autonomy is also compromised. I argue that the same holds true at the intergroup level: Specifically, I propose that low-power groups have the capacity to experience high levels of collective autonomy so long as their collective autonomy is supported by the high-power group.

Collective autonomy and collective efficacy. Collective efficacy pertains to group members' perception that they have the ability and capacity to perform a specific behavior (such as a cultural custom) or to achieve their shared group goals (Gibson, Randel & Early, 2000). At the individual level, both personal autonomy and self-efficacy (also referred to as competence) have important and unique implications for well-being (e.g Deci & Ryan, 2000). Importantly, SDT has made conceptual distinctions between personal autonomy and personal efficacy: SDT proposes that individuals may feel efficacious in enacting a behavior yet, at the same time, feel

pressured and controlled to do so. For example, an elite athlete may feel a high level of self-efficacy with respect to her capacity to perform well in her sport, yet play the sport for controlled reasons such as for fame and monetary gains (*low personal autonomy*). I argue that the same argument can be applied to the group level: Group members may feel highly efficacious with respect to their capacity to practice their own culture or to speak their own language (*high collective efficacy)* yet, also feel that other groups try to prevent their group from practicing their culture openly in society (*low collective autonomy*).

Collective autonomy and collective control. Collective control refers to group members' perception that their group's outcomes (both positive and negative) are under their group's control rather than the control of external forces (Mirowsky, Ross, & Willigen, 1996; Tiessen, Taylor & Kirmayer, 2009). Feeling collective control and personal control have both been associated with experiencing greater psychological well-being (Greenway et al., 2015; Tiessen, et al., 2009). At the individual level, distinctions have been made between having a personal *locus of control* and having a personal *locus of causality,* which refers to personal autonomy (Deci & Ryan, 1985b; Deci & Ryan, 1987; Ryan & Connell, 1989). For example, it is possible for a person to feel that there is a strong relation between their behaviours and their personal outcomes (i.*e. internal locus of control*) yet, also, feel that their behaviours are driven by external pressures and controls (*i.e. external locus of causality*). Imagine a student who studies furiously for a math test because of external pressures from her parents. The student may feel that her grade will be determined on the basis of how much she studies (*i.e. internal locus of control*). Yet, the only reason that the student chooses to study is because of external pressures from her parents (*i.e. external locus of causality*).

Similarly, at the group level, I propose that perceptions of collective control are distinct from perceptions of collective autonomy. For example, group members who feel that their group lacks collective autonomy may still feel that the outcomes of their group are a result of their collective actions as a group (*high internal locus of control*). Imagine a group that feels unwelcome to practice its customs and traditions openly in society, or that has been forced to adopt the traditions of another group (*low-collective autonomy*). This group may still perceive that the future outcomes of their group will be determined on the basis of whether they choose to tolerate the controls imposed on their group, or attempt to resist these controls through collective action (*high internal locus of control*).

Collective autonomy and perceived prejudice and discrimination. Perceptions of prejudice and discrimination involve group members feeling that their ingroup is disliked or is judged to be inferior by other groups or is treated negatively by other groups (Branscombe et al., 1999). It is likely that, when group members have their collective autonomy unduly restricted by another group, they may feel disliked or discriminated against by that group. Importantly, however, I argue that it is not necessarily the case that group members who feel that their group is the target of intergroup prejudice will also feel that their group has been deprived of its collective autonomy. Group members may hold negative attitudes towards other groups, and even treat other groups unjustly by restricting their access to valued resources or by exploiting them, without necessarily restricting their collective autonomy. For example, several minority groups living in the United States, such as Muslim-Americans, African-Americans, and Latinos have been the target of explicit prejudice and discrimination. However, it can be argued that, at different points in each group's history, the extent to which social policies have restricted the collective autonomy of these groups has varied.

Collective autonomy threat and other forms of identity based threats. Threats to collective autonomy can also be dissociated from other forms of social-identity-based threats (Branscombe, et al., 1999; Stephan, et al., 2005; Stephan, et al., 1998; Stephan, et al., 1999).

Collective autonomy and distinctiveness threat. One important distinction that can be made is between collective autonomy and group members' perception of *intergroup distinctiveness*: Group members' perception that the attributes that are prototypical of their own group are different from the attributes which are prototypical of other relevant groups within their intergroup context. Some of the social processes which may undermine group members' collective autonomy may also simultaneously threaten group members' distinctiveness. For example, during the process of forceful assimilation, the assimilated group is robbed of their freedom to practice its own culture (i.e., threatening to collective autonomy), and is forced to adopt the same cultural practices as the assimilating group (i.e., threatening to distinctiveness and collective autonomy). Importantly, however, group distinctiveness is not necessarily threatened in parallel with threats to collective autonomy. In the context of slavery, groups are often prevented from practicing their own culture, yet are also prevented from practicing the culture of the enslaving group. Moreover, societal processes that restrict certain groups from practicing their culture openly in society, do not necessarily prescribe that these groups follow the cultural practices of another group in society. Thus, despite lacking collective autonomy in these contexts, groups may not experience a threatened sense of group distinctiveness.

Collective autonomy and value threat. We also argue that collective autonomy threats can be differentiated from value threat. Value threat refers to the anxiety that group members might experience when they feel that the specific norms, ideologies, and values that comprise their own culture directly conflict and clash with specific components of the outgroup's culture (Stephan,

et al., 2005; Stephan, et al., 1998; Stephan, et al., 1999). We propose that collective autonomy threats and value threats are also distinct. Group members may feel highly threatened by specific components of an outgroup's culture (*high-value threat)*, yet at the same time, still feel free to practice their own culture openly in society (*low collective-autonomy threat)*. In contrast, even if group members do not feel particularly threatened by specific components of the outgroup's culture (*low-value threat*), they may experience a collective autonomy threat if they feel the outgroup has undermined their own group's capacity to freely express their culture (*high collective autonomy threat*). Consider the example of ethnic-minority group members who are not permitted by the majority group to practice the culture of their own minority group openly in society. In this case, members of the ethnic minority might not necessarily feel threatened by specific aspects of the majority group's culture. Rather, it is likely that members of the ethnic-minority group will be pre-occupied with the fact that the majority group has prevented their group from practicing their own culture.

In this thesis, within the experiments that seek to manipulate a group's collective autonomy, group members were never informed as to the specific content of the outgroup's culture. Thus, group members could not be threatened by the content of the outgroup's culture (value threat). Moreover, group members did not necessarily believe that they were being forced to adopt the cultural customs and practices of the other group (distinctiveness threat). Therefore, it was not possible for collective autonomy threats to be confounded with value threat or distinctiveness threat in the experiments described in the present thesis.

The Present Program of Research

For the first time, the present thesis empirically examines the psychological consequences of feeling collectively autonomous for individual group members and intergroup relations. First,

I test whether the extent to which people feel personally autonomous and volitional as individuals is related in part to their perception of their group's collective autonomy. Secondly, I examine how group members' psychological well-being might also be impacted by their perception of collective autonomy. Finally, I test whether having one's collective autonomy threatened rather than supported by a high-power outgroup fuels low-power group members' desire to pursue more power for their group, to challenge their social system, and to engage in collective action. I test these hypotheses across two related manuscripts.

In Manuscript 1, I examine the impact of perceived collective autonomy on the psychological adjustment of group members. Specifically, the relation between collective autonomy and group members' satisfaction of their basic need to feel personally autonomous is tested both with real-world cultural groups, and experimentally with artificially created groups in the laboratory. Moreover, the downstream consequence of collective autonomy for group members' psychological well-being is examined. In Manuscript 2, I address the implications of collective autonomy for intergroup relations. Specifically, I the impact of collective autonomy threats on low-power group members' willingness to pursue group power, challenge their social system, and engage in collective action is assessed. Again a multi-method design using both correlational data from real-world groups, and experimental data for artificially-constructed laboratory groups is employed.

MANUSCRIPT 1: The chains on all my people are the chains on me: Collective autonomy is a nutrient for personal autonomy and psychological wellbeing

Kachanoff, F.J., Taylor, D.M., Caouette, J., Khullar, T.H* & M.J., Wohl,. (2017). The chains on all my people are the chains on me: Collective autonomy is a nutrient for personal autonomy and psychological wellbeing. (Invited to resubmit revised manuscript, *Journal of Personality and Social Psychology*).

Abstract

Collective autonomy reflects group members' perception that their social group is free to define and practice its own culture. Across three studies we investigated the impact of collective autonomy on group members' personal autonomy and psychological wellbeing. In Study 1, using three distinct samples ($N_{Sample\ 1a} = 123$, $N_{Sample\ 1b} = 129$, $N_{Sample\ 1c} = 370$), correlational and cross-cultural evidence is provided for a link between group members' perceptions of collective autonomy and their sense of personal autonomy. In Study 2 (N=389), we experimentally manipulated the presence of a threat to collective autonomy. Results showed that collective autonomy-threatened group members experience less personal autonomy than those who were exposed to a collective autonomy-supportive situation. Finally, in Study 3 (N=273), we had group members describe a time during which their real-world ingroup lacked (or had) collective autonomy. Akin to the previous studies, participants who were primed to think their group lacked collective autonomy reported reduced feelings of personal autonomy, and reduced psychological wellbeing (compared to those where primed to think their group had collective autonomy). Implications of these findings for the psychological wellbeing of individual group members and intergroup relations are discussed.

Introduction

"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)

Social groups are often defined on the basis of their distinct social identity and rich culture (Tajfel & Turner, 1979; Triandis & Gelfand, 1998). Indeed the shared norms, values, beliefs, customs and practices that become associated with social categories are the very essence of a meaningful social identity (Taylor, 2002; Oyserman, 2007). Often in society, group members have *collective autonomy* - the freedom to openly articulate and practice their own culture and social identity. Yet, this may not always be the case. At the extreme – in instances of forceful assimilation, colonization and slavery - one group (or groups) may forbid another group from practicing their traditions and preserving their culture. In such contexts, the oppressed group may be forced to eschew their traditions and culture and adopt cultural practices, customs and values that are not their own, which should have deleterious consequences for the wellbeing of group members.

In this current research, we propose the heretofore unexamined idea that group members desire collective autonomy because it promotes their feeling personally autonomous as individuals – a basic and universal psychological need (Deci & Ryan, 2000; Ryan & Deci, 2000a). Thus, lacking collective autonomy may undermine group members' personal autonomy, which should undermine psychological wellbeing. To test this idea, we first examine whether feeling collectively autonomous bolsters group members' feelings of personal autonomy. Subsequently, we assess the impact of collective autonomy for an important health outcome robustly associated with personal autonomy: psychological wellbeing. The ultimate goal of the

current work is to shed light on collective autonomy threats – a factor that has received very little theoretical or empirical attention.

Collective Autonomy as a Nutrient for Personal Autonomy

Personal autonomy is the sense of volition and authenticity that arises when people feel that they are free to both determine their own personal identity (i.e., their own values, goals, and aspirations) and act in accordance with that identity (Deci & Ryan, 2000; Deci & Ryan, 2008; Weinstein, Przybylski, & Ryan, 2012). Conversely, when people have their personal autonomy thwarted they feel controlled, manipulated or unduly pressured by outside forces (Chen et al., 2015). Much of the empirical research concerning personal autonomy has been informed by self-determination theory – a meta-theory of human motivation and wellbeing (SDT; Deci & Ryan, 2000; Deci & Ryan, 2008). Importantly, there is extensive evidence that personal autonomy is positively associated with psychological wellbeing across individualistic and collectivistic cultures (Chen et al., 2015; Chen, Van Assche, Vansteenkiste, Soensens, & Beyers, 2015; Chirkov & Ryan, 2001; Chirkov, Ryan, Kim, & Kaplan, 2003; Chirkov, Sheldon & Ryan, 2011; Deci, et al., 2001; Vansteenkiste, Ryan & Deci, 2008). Thus, because of the robustness and universality of the link between personal autonomy and psychological wellbeing, SDT has argued that personal autonomy is a basic and universal psychological need (Deci & Ryan, 2000; Deci & Ryan, 2008), and has called for research to determine the antecedent factors that promote personal autonomy (Ryan & Deci, 2000a). The present research answers this call by testing whether group members' perception of the autonomy afforded to their important social groups – collective autonomy – directly impacts their own personal autonomy.

The idea that group members' perceptions of collective autonomy might relate to their own personal autonomy is consistent with social identity theory (SIT; Tajfel & Turner, 1979,

1986). SIT proposes that group members derive, inform, and evaluate their self-concept in part on the basis of their social identity. Associated with a group's social identity is a broad set of cultural values, norms, customs, and practices (Chirkov et al., 2003; Triandis & Gelfand, 1998). Furthermore, social identities impact the behaviors of group members by providing them with a prototype from which to derive their aspirations and long-term goals (Fryberg, Markus, Oyserman, & Stone, 2008; Oyserman, 2007; 2009; Oyserman, Bybee, & Terry, 2006). Importantly, this normative information provides every group member with a template with which to compare and evaluate themselves in relation to other group members (Taylor, 1997; 2002). Even if group members do not personally adopt their own group's values and customs, the very knowledge of its culture provides a normative backdrop that allows group members to define and articulate a clear sense of self (Kymlicka, 1989; 1996; Taylor, 1997; 2002). Indeed, by knowing how one is similar to *and* dissimilar from other members within their group, group members can maintain a clear sense of self (Usborne & Taylor, 2010; Usborne & Taylor, 2012).

In sum, SIT provides evidence that people derive part of who they are (their self-concept) and what they do (their behaviors) from their social groups. On this basis, we argue that in order to feel personally autonomous as individuals, group members must feel that their social groups as entities are collectively autonomous. When groups cannot determine their own culture, group members may have no other option but to define their personal sense of self on the basis of values and practices that were forcefully imposed upon their group. Furthermore, when groups lack collective autonomy, group members may not feel free to naturally articulate their sense of self on the basis of their own culture. For example, in his description of Apartheid, Nelson Mandela describes a basic link between the lack of freedom and autonomy that Black South Africans felt collectively as a people, and the lack of freedom and autonomy that any one Black

South African felt as an individual. Thus, Mandela observed that his capacity to feel *personally* autonomous was directly related to the *collective autonomy* that he and his fellow South Africans experienced as a people (Mandela, 1995). Building on insights from SIT, we argue that collective autonomy may be an important antecedent of personal autonomy, and should be considered as such within SDT.

Positioning Collective Autonomy as Distinct Factor Within SDT

A basic tenet of SDT is that an individual enjoys personal autonomy to the extent that the individual receives personal autonomy support from others in their social environment (Deci & Ryan, 1987; Ryan & Deci, 2000a; Williams, Grow, Freedman, Ryan & Deci, 1996). Our idea that group members' perceptions of collective autonomy may vary depending on the nature of their intergroup environment parallels SDT's description of *personal autonomy-supportive* environments. In such environments, people acknowledge and respect each other's perspectives and emotions, provide each other with choices and clear rationales, and respect each other's own ways of behaving. In contrast, environments that threaten people's personal autonomy rely on the use of external rewards, punishments, and pressures to control people's behaviors.

Applying the concept of autonomy at the group level, we argue that some intergroup contexts may be more supportive of a group's collective autonomy than others. For example, societies that embrace multiculturalism are more accepting of different cultures co-existing and practicing their own distinct cultures openly in society (Berry & Kalkin, 1995; Breugelmans & Van de Vijver, 2004; Guimond et al., 2009;Van de Vijver, Breugelmans, & Schalk-Soekar, 2008). In contrast, intergroup contexts that place restrictions on group members' freedom to determine and practice their culture may undermine group members' collective autonomy. For example, Indigenous peoples in Canada were forcefully prevented from practicing their own

culture and speaking their own language through the implementation of residential schools (Taylor, 2002; Taylor & de la Sablonnière, 2014; Truth and Reconciliation Commission of Canada, 2015). Likewise, members of the Kurdish ethnic group in Turkey have faced imprisonment and torture for attempting to speak their own language or for naming their children with traditional Kurdish names (Baran, 1986; Gunes, 2013). In the same way that social environments that are personal autonomy-supportive (rather than unsupportive) promote personal autonomy, we propose that intergroup environments that are *collective autonomy-supportive* (rather than unsupportive) may also promote personal autonomy. Thus, we contend that the social environment outlined by SDT must also include the intergroup environment, which can be either supportive or unsupportive of collective autonomy.

Conceptual distinctions can be made between collective autonomy support and personal autonomy support. At a macro level, the social structure and interpersonal norms *within* a group may have implications for whether individuals receive personal autonomy support. For example, hierarchical cultures that emphasize submission to authority may be less conducive to supporting personal autonomy relative to egalitarian cultures that emphasize equality (Chirkov, et al., 2003; Downie, Koestner, & Chua, 2007; Downie, Koestner, ElGeledi, & Cree, 2004). However, we argue that the extent to which ingroup members support each other's autonomy internally is independent from the group's collective autonomy within an intergroup context. For example, a group may have collective autonomy in a pluralistic society, and, at the same time be ruled by a dictatorship from within. In this regard, political philosopher Isaiah Berlin famously differentiated between groups being controlled by harsh dictators from within or benevolent rulers from the outside (Berlin, 1969). Here, we propose that personal autonomy support from

ingroup members, and collective autonomy support from outgroup members are different, yet both critical determinants of personal autonomy.

We also distinguish collective autonomy from the personal reasons or personal regulatory style that group members may have for practicing their group's culture (e.g., Chirkov et al., 2003; Ryan & Deci, 2000b; Yampolsky & Amiot, 2013). Group members may follow their culture for autonomous reasons (e.g., because they value or enjoy their cultural practices) or controlled reasons (e.g., because of external pressures from family members). Across individualistic, collectivistic, horizontal, and vertical cultures, having personal autonomous rather than controlled reasons for practicing one's culture is positively associated with greater wellbeing (Chirkov et al., 2003). However, an important distinction can be made between the personal reasons that group members have for practicing their culture and collective autonomy. For example, a group member may personally value and desire to speak their group's heritage language openly in public (autonomous regulatory style), yet not be permitted to do so by the laws and regulations put in place by other groups within their society (lack of collective autonomy). Thus, we expect that group members' personal reasons for practicing their culture, as well as their collective autonomy to do so, will relate independently to their personal sense of autonomy.

Consequences of Collective Autonomy for Psychological Wellbeing

The primary objective of the present research is to test whether having collective autonomy predicts the personal autonomy expressed by group members. However, we are also interested in the effects of collective autonomy on important outcomes that have previously been associated with personal autonomy. Specifically, personal autonomy has been shown to be a consistently strong predictor of psychological wellbeing (e.g., Chirkov, et al., 2011; Deci &

Ryan, 2008; Vansteenkiste, et al., 2008). We contend that collective autonomy is likewise positively associated with the psychological wellbeing of group members. If collective autonomy has a direct impact on group members' personal autonomy, then it follows that collective autonomy might also impact psychological wellbeing through personal autonomy. In this light, we hypothesize that collective autonomy will be positively associated with greater psychological wellbeing – an association mediated by personal autonomy.

Overview of Present Research

Across three studies (and one internal replication study), we tested our hypothesis that collective autonomy would have a direct impact on group members' perceptions of personal autonomy. Furthermore, we examined whether collective autonomy would impact group members' psychological wellbeing through personal autonomy. Across these studies, we sought to establish the uniqueness of collective autonomy's role for personal autonomy and wellbeing, beyond other important self-determination factors that have previously been associated with personal autonomy. Specifically, we differentiated collective autonomy from personal autonomy support and group members' personal reasons for practicing one's culture.

We also sought to differentiate collective autonomy from potentially overlapping constructs within the social identity framework (Tajfel & Turner, 1979). First we differentiated collective autonomy from collective agency (Shnabel & Nadler, 2015; Shnabel, Nadler, Ulrich, Dovidio, & Carmi, 2009; Simontov-Nachielli & Shnabel, 2014), which involves feeling strong, powerful and efficacious as a group. For example, a group member may feel highly capable of speaking their cultural language (high efficacy) but may be forbidden from doing so in society (low collective autonomy). Furthermore, a group may lack power and influence within their society (low power) but nevertheless have their collective autonomy respected by high-power

groups (high collective autonomy). In this light, we anticipated that collective autonomy would relate to personal autonomy and psychological wellbeing when controlling for feelings of group power and collective efficacy (two important aspects of agency).

We also argue that collective autonomy is distinct from general perceptions of being disliked or discriminated. Specifically, when group members feel that an outgroup has actively tried to threaten their group's collective autonomy this may result in group members feeling discriminated against and disliked by that outgroup. However, we argue that it is not necessarily the case that group members who report feeling discriminated against by another group will report the presence of a collective autonomy threat. For example, an outgroup may make it clear they do not like one's ingroup, or think it is inferior, without preventing it from determining and practicing its own culture. Thus, while past work has linked perceived discrimination to psychological wellbeing (Branscombe, Ellemers, Spears, & Doosje, 1999; Rowley, et al., 1998), we expected that collective autonomy would have a positive association with personal autonomy and psychological wellbeing, even when controlling for perceived discrimination.

In Study 1, across three independent cross-cultural samples (combined N=622), including participants from both individualistic and collectivistic cultures we tested whether collective autonomy relates to personal autonomy beyond factors previously considered by SIT and SDT. In Study 2 (N=389), we created an engaging interactive laboratory experiment in which we systematically threatened or supported the collective autonomy of a group. Specifically, groups created a meaningful collective identity and subsequently, were ostensibly permitted (or not) by another outgroup to act in accord with their identity. By doing so, we experimentally tested the basic assumption that group members would prefer engaging in cultural practices and customs that reflected their own culture rather than a different culture that was forcefully imposed on

their group. Importantly, we also tested the impact of having collective autonomy support (or not) on whether group members felt a sense of personal autonomy. Finally, in Study 3 (N=271), we manipulated collective autonomy with respect to one's cultural group using a writing task and examined its effect on personal autonomy. Furthermore, we tested whether collective autonomy would impact the psychological wellbeing of group members through its effect on personal autonomy.

Study 1

With three culturally diverse samples, we tested our overarching hypothesis that group members' perceptions of collective autonomy would relate positively to their own personal sense of autonomy. The purpose of collecting data from three samples was to 1) replicate the findings from the initial sample and 2) assess the generalizability of effects across cultural groups. We assessed the cross-cultural generalizability of our proposed effects given past debate as to whether autonomy would be more psychologically important amongst people from individualistic cultures rather than collectivistic cultures (Chirkov et al., 2003). In this regard, a strength of SDT has been its emphasis on generalizing the psychological importance of personal autonomy for individuals across individualistic and collectivistic cultures (Chen et al., 2015; Chirkov et al., 2003). Extending this hypothesis of cross-cultural generalizability to the present research, we anticipated that collective autonomy would be associated with personal autonomy for group members from both individualistic cultures (i.e., the United States) and collectivistic cultures (i.e., India). A more general aim of Study 1 was to differentiate collective autonomy from other potentially overlapping constructs within SDT (personal autonomy support, and personal regulatory style) and SIT (perceived discrimination, group power and collective efficacy).

Method

In all three samples, collective autonomy was 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 also 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)[1] .The name of participants' core cultural group which was generated initially by participants was auto-populated into all further relevant scale items. Agreement with all questionnaire items was rated using a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree).

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

[1] Scales were included within a larger survey (See Supplemental Materials) that also assessed other potentially overlapping variables that we wished to differentiate from collective autonomy. Specifically, group identification was measured in Samples 1a-1c, group distinctiveness was measured in Samples 1a-1b, and collective control was measured in Sample 1c. Collective autonomy was significantly related to personal autonomy when controlling for these additional variables (see Supplemental Analyses 1). Moreover, group identification did not moderate the relation between collective autonomy and personal autonomy (Supplemental Analyses 2). We also assessed psychological wellbeing in order to conduct preliminary exploratory analyses to test our second hypothesis that collective autonomy would indirectly impact psychological wellbeing through personal autonomy. In all three studies, we found that collective autonomy had a significant indirect effect on psychological wellbeing, through personal autonomy (see Supplemental Analyses 4).

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 .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-six-point-five percent of the final sample resided in India, 45 % 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 .75$ U.S. dollars.

In Sample 1c, 557 workers from the crowdsourcing network Crowdflower (de Winter, Kyriakidis, Dodou, & Happee, 2015) completed the survey[2]. We excluded 187 participants who failed the attention checks embedded in the survey, accessed and completed the survey for a 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

[2] 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.

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

Collective autonomy. In all sample studies, collective autonomy was measured using 16 items that we generated based on our operational definition of collective autonomy: the belief that one's ingroup is free in society to *determine* and *practice* its own culture and identity, and is not unduly controlled by other groups. Thus, we developed items pertaining to group members' general perception (1) that their group has been able to define and practice its culture e.g., "we (*insert group name*) have been free to determine our identity", (2) that other groups have supported their group's freedom to practice its culture, e.g., "In general, other groups support the right that we have to follow our customs and practices", and (3) that other groups have not tried to undermine their group's collective autonomy, e.g., "In general, other groups try to control the extent to which we can act in accordance with our cultural identity" (reverse scored)[3]. The inter-item reliability of the scale was high in all 3 samples (Sample 1a, $\alpha = .92$; Sample 1b**,** $\alpha = .91$; Sample 1c**,** $\alpha = .94$), and the corrected item-total correlation coefficients ranged from .44 to .79 across the three sub-samples (see Supplementary Analyses 4).

[3] Items were phrased such that all items assessing group members' perceived freedom to practice and determine one's culture were positively scored (e.g., We have been free to determine our identity). In contrast, all the items assessing feeling controlled and restricted by outgroups were negatively scored (e.g., Other groups have tried to control what customs and practices we should follow). We intentionally phrased the scale in this manner, as we reasoned that it would be most intuitive for participants to rate the extent to which they felt free or controlled, rather than to have participants rate the extent to which they *did not* feel free to practice their culture or *did not* feel controlled by other groups. In Sample 1c, to ensure that our results would not change if we assessed collective autonomy with a scale that also contained negatively scored items assessing group members' freedom to practice and determine their culture (e.g., We have NOT always felt free to determine our own cultural identity: our customs, practices, values, beliefs, and traditions) and positively scored items assessing group members' perception that other group's controlled their group (e.g., In general, other groups have NOT tried to prevent us from behaving in ways that reflect our cultural values and shared beliefs). Both scale versions were highly correlated (.93) and the factor structure and significance of our results did not change regardless of which scale we utilized (See Supplemental Analyses 4).

Personal autonomy. In all three samples, personal autonomy was measured using six items adapted from Sheldon and Gunz (2009). Items included: "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 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", (Sample 1a α=.71; Sample 1b α=.73; Sample 1c α=.74).

Group power. In all three samples group members' perception of feeling powerful as a group was assessed using 4 items adapted from Shnabel and Nadler's (2008) measure of personal power. A sample item included: "My core cultural group has a lot of power as a group", (Sample 1a α=.92; Sample 1b α=.91; Sample 1c α=.93).

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 an adapted version of Williams and colleagues' (1996) measure of personal autonomy support. Items included: "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"; (Sample 1b α=.91; Sample 1c α=.92).

Personal regulatory style for practicing culture. In Samples 1b and 1c, group members' regulatory style for acting in accordance with their cultural customs and practices was measured with 8 items (adapted from Chirkov el al., 2003; Study 1b α=.79; Study 1c α=.80). 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.

Collective efficacy. In Sample 1c, collective efficacy was measured using a five-item scale (adapted from Gibson, Randel, & Early, 2000). The collective efficacy scale included three items that assessed group members' perception of collective efficacy in general (e.g., "My core cultural group can overcome any problem it faces"), and 2 items that assessed collective efficacy with respect to specific group practices (e.g., "Members of my core cultural group have confidence in their ability to speak their own language", α=.82).

Perceived discrimination. In Sample 1c, general perceptions of discrimination were assessed with three items: "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" (α=.69).

Results and Discussion

Preliminary analyses. Using data from the combined samples we examined the factor structure of the collective autonomy scale. This was done in two separate phases: first, an exploratory factor analysis (EFA) was conducted on half the sample (n=311) selected at random, after which a confirmatory factor analysis (CFA) was conducted on the second half of the sample (Bryant & Yarnold, 1995;Fabrigar, Wegener, MacCallum, & Strahan, 1999). Exploratory factor analysis was conducted using principal component analysis as the extraction method, and Oblimin rotation given that we expected the sub-factors to be correlated (Jolliffe, 2002). Table 1 displays the pattern matrix in which factor loadings greater than .32 shown.

	Factor 1 Collective Autonomy Restrictions	Factor 2 Feeling of Collective Autonomy	Factor 3 Collective Autonomy Support
[C1] Other groups have tried to control us (*rev. scored*).	0.84		
[C2] Other groups have tried to control what we can do *(rev. scored)*.	0.89		
[C3] Other groups have tried to control what we should value and believe *(rev. scored)*.	0.84		
[C4] Other groups have tried to control what customs and practices we should follow *(rev. scored)*.	0.82		
[C5] In general, other groups try to control the extent to which we can act in accordance with our cultural identity *(rev. scored)*.	0.85		
[C6] In general, other groups try to control the extent to which we can follow our customs and practices *(rev. scored)*.	0.83		
[C7] In general, other groups try to control the extent to which we can act in accordance with our cultural values *(rev. scored)*.	0.84		
[C8] Other groups impose aspects of their culture onto our culture *(rev. scored)*.	0.74		
[C9] We have been free to determine our identity.		0.91	
[C10] We have been free to determine our customs and practices.		0.86	
[C11] We have been free to determine our core values and shared beliefs.		0.83	
[C12] We have been free to determine who we are as a people.		0.91	
[C13] We have been free to determine what we do as a people.		0.82	
[C14] In general, other groups support the right that we have to act in accordance with our identity.			0.86
[C15] In general, other groups support the right that we have to follow our customs and practices.			0.77
[C16] In general, other groups support the right that we have to act in accordance with what we value.			0.89

Table 1. Pattern Matrix derived from exploratory factor analysis using principal component analysis for extraction, and Oblimin rotation (Study 1, Manuscript 1).

Exploratory factor analysis revealed a three factor solution in which one factor was represented by group members' perception that their group was restricted and controlled by other groups, (Eigenvalue= 7.97, variance explained = 49.78); one factor was represented by people's perception that their group was free to determine and practice its culture (Eigenvalue = 2.79; variance explained=17.45); and one factor was represented by group members' perception that their collective autonomy was supported by other groups in society, (Eigenvalue = 1.22, variance explained = 7.62).

Given that the three factors extracted by the EFA supported our proposed theoretical model, we conducted CFA using Lavaan (Rosseel, 2012). Specifically, we examined the fit of a model in which three first order latent variables representing each factor retained from the EFA were loaded on a second order latent variable of collective autonomy (See Figure 1). The model had acceptable model fit indices (CFI=.97, *SRMR*=.03, RMSEA=.05, *BIC*=14707.48; Byrne, 1994; Steiger, 1990), no negative error variances or improper solutions, and significantly better model fit than a comparison model in which responses to all scale items loaded onto one first order latent variable *(CFI=.65, SRMR=.15, RMSEA=.19, BIC*=15731.30*;* $\Delta\chi^2$*=1040.8, p<.001).*

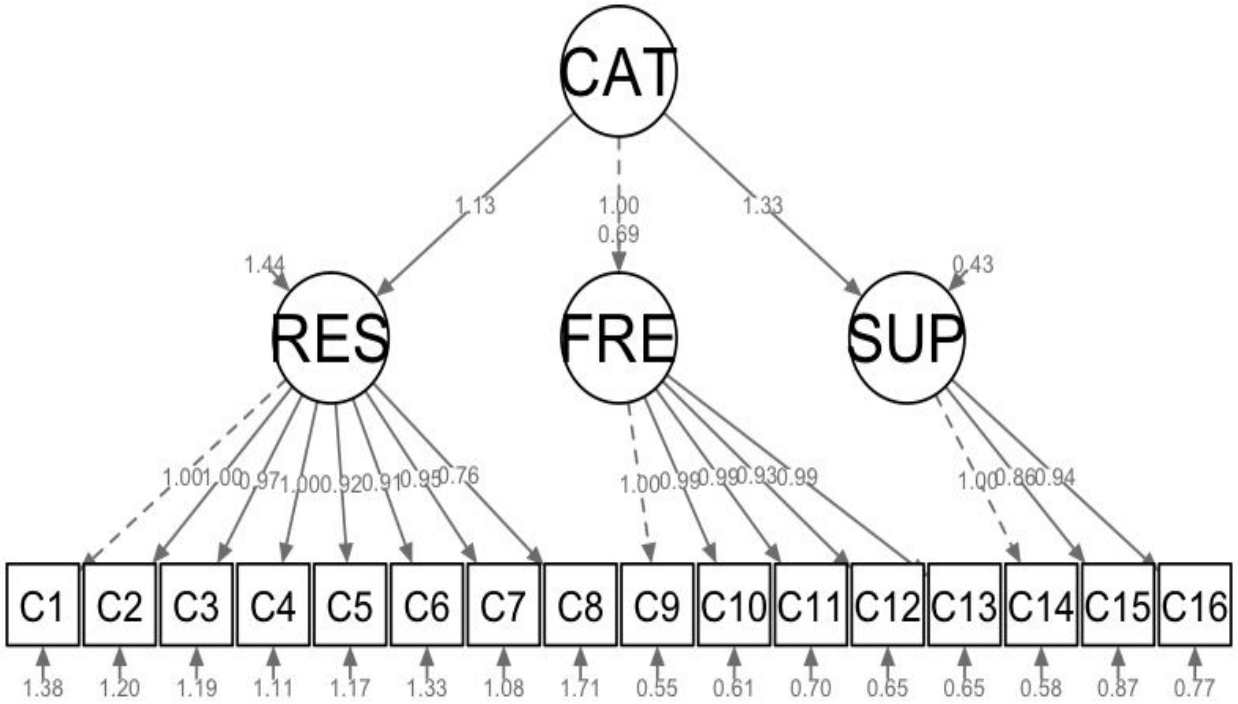

Figure 1. CFA model tested in Study 1, Manuscript 1. Collective Autonomy (CAT) was defined as a second order latent variable comprised of three first order latent variables: Feeling unduly restricted and controlled by other groups (RES; items reverse scored), feeling free to determine and practice one's culture (FRE), and feeling that one's collective autonomy is supported by other groups (SUP). Note: The model had acceptable fit indices (CFI=.97, SRMR=.03, RMSEA=.05) and no negative error variances or improper solutions. Moreover, this three factor model had significantly better fit than a one factor model in which all observed items were loaded onto one latent factor: CFI=.65, SRMR=.15, RMSEA=.19, $\Delta\chi^2$ *=1040.8, p<.001.*

In a second CFA, we then tested whether the items assessing collective autonomy 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, using CFA, we tested a model consisting of 5 independent first-order factors (three collective autonomy sub-factors, and 2 personal autonomy sub-factors) that were loaded onto second order latent variables representing collective autonomy and personal autonomy respectively (See Figure 2). As expected, this proposed model fit the data well, *CFI*=.95, *SRMR*=.07, *RMSEA*=.06, *BIC*=20076.22, and there were no negative error variances or improper solutions within the model. Moreover, this model had significantly better fit than a comparison model in which responses to all of the collective autonomy and personal autonomy items were loaded onto one latent factor, *CFI*=.59, *SRMR*=.14, *RMSEA*=.16), *BIC*=21315.84, $\Delta\chi^2$=1273.4, p<.001.

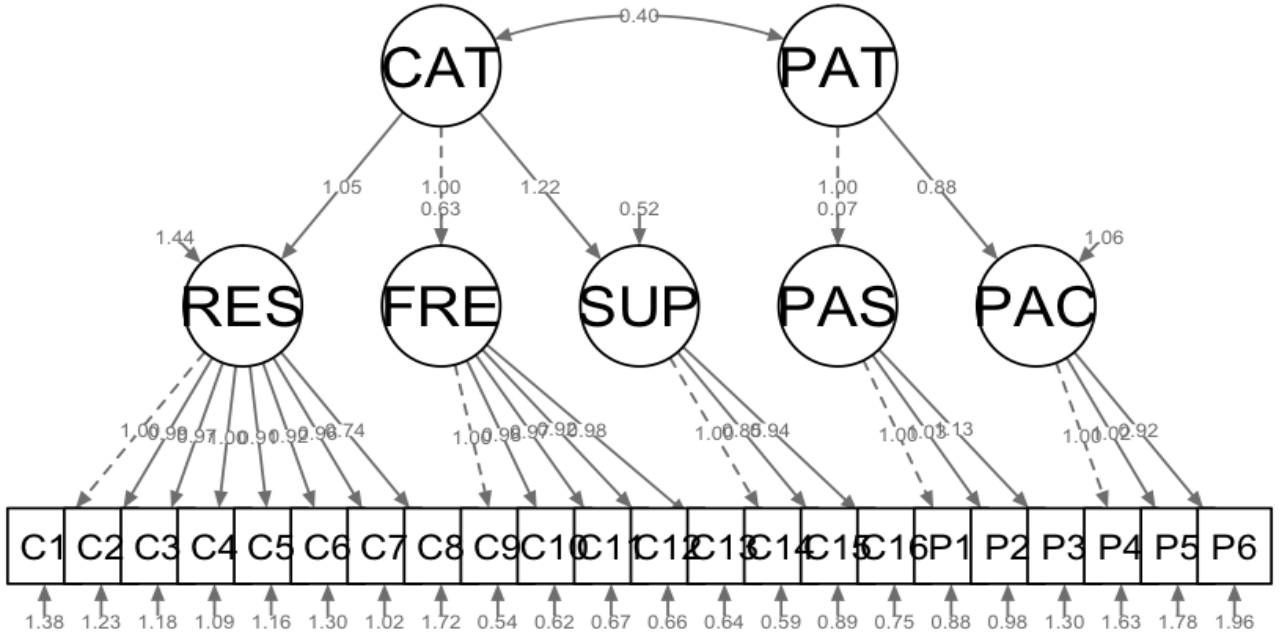

Figure 2. CFA model tested in Study 1, Manuscript 1, ensuring that collective autonomy (CAT) and personal autonomy (PAT) comprise two separate constructs. Collective Autonomy (CAT) was defined as a second order latent variable comprised of three first order latent variables: feeling unduly restricted and controlled by other groups (RES), feeling free to define and practice one's culture (FRE), and feeling that one's collective autonomy is supported by other groups (SUP). Personal autonomy was defined as a function of two first order latent variables: Personal autonomy need satisfaction (PAS) and personal autonomy need thwarting (PAC). Note: Collective autonomy and personal autonomy were significantly related in the model, b=.40,SE=.08, Z=4.96, *p<.001. The model had acceptable fit indices (CFI=.95, SRMR=.07, RMSEA=.06) and no negative error variances or improper solutions. Moreover, this model had significantly better fit than a comparison model in which all of the observed collective autonomy and personal autonomy items were loaded onto one latent factor, CFI=.59, SRMR=.14, RMSEA=.16),* $\Delta\chi^2$*=1273.4, p<.001.*

Lastly, we examined if the factor structure (configural invariance) and the meaning of the constructs (metric invariance) were invariant across samples recruited from a collectivistic (Eastern) culture and an individualistic (Western) culture (Gregorich, 2006; Meredith, 1993; Sass, 2011). Specifically, we compared participants from our combined sample who resided in America, an individualistic culture (N=233), to participants who resided in India, a collectivistic culture (India, N=252). We chose to compare participants from these two countries because we had a large number of participants representing both countries, and because there is consensus as to whether each country is considered individualistic versus collectivistic (Triandis & Gelfand, 1998). Indicative of configural invariance, we found acceptable model fit indices for the American sub-sample (*CFI*=.97, *SRMR*=.04, *RMSEA*=.07, *BIC*=10735.10) and the Indian sub-sample (CFI=.96, SRMR=.04, RMSEA=.06, *BIC*=11917.86) when we conducted CFA on the 3-factor model with each group independently. Moreover, multiple group CFA testing a model in which we allowed all model parameters to vary freely across the two cultural groups had acceptable fit indices, *DF=202,* CFI=.97, SRMR=.04, RMSEA=.07, *BIC*=22896.64, χ^2=1273.4. Next, we assessed metric invariance by comparing the non-constrained (base-line) model in which all parameters could vary across cultures, to a constrained model in which the factor loadings could not vary across cultures. Indicating metric invariance, relative to the non-constrained model, the model fit indices of the constrained model did not differ significantly, ΔDF=15, ΔCFI=-.001, ΔSRMR=.011, ΔRMSEA=-.001, ΔBIC=-11 , $\Delta\chi^2$=19.65, p=.19.

Together these results indicate that (1) the observed items of the collective autonomy scale tapped a second order latent construct of collective autonomy consisting of three first order latent factors, (2) that our scale assessed a distinct construct from personal autonomy, and (3) that the factor structure and meaning of the scale were equivalent for people from collectivistic

and individualistic cultures. On this basis, to be parsimonious in our analyses, we utilized combined scores of collective autonomy in all further analyses. Furthermore, in all further analyses, as is convention with most SDT research, we combined the personal autonomy frustration and satisfaction sub-factors to compute a composite personal autonomy score.

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.

	M	*SD*	1	2	3
1. Collective Autonomy	4.58	1.01		.45**	.46**
2. Personal Autonomy	4.96	1.04			.26*
3. Group Power	5.88	1.32			

*Note: *p<.05, **p<.01 , ***p<.001.* Analyses were conducted using pair-wise deletion.

Table 2. *Intercorrelations among collective autonomy, personal autonomy, and group power (Sample 1a, Manuscript 1)*

	M	*SD*	1	2	3	4	5
1. Collective Autonomy	4.59	.97		.32***	.35***	.17*	.13
2. Personal Autonomy	4.85	1.12			.27**	.36***	.31***
3. Group Power	5.97	1.21				.42***	-.03
4. Personal Autonomy Support	5.56	.91					.41***
5. Personal Regulatory Style	4.88	1.09					

*Note: *p<.05 , **p<.01, ***p<.001.* Analyses were conducted using pair-wise deletion.

Table 3. *Intercorrelations among collective autonomy, personal autonomy, group power, personal autonomy support, and personal regulatory style (Sample1b, Manuscript 1)*

	M	*SD*	1	2	3	4	5	6	7
1. Collective Autonomy	4.65	1.21		.31**	.35**	.21**	.15*	-.52**	.26**
2. Personal Autonomy	4.92	1.03			.17**	.28**	.30**	-.16**	.25**
3. Group Power	5.58	1.26				.36**	.10	-.24**	.55**
4. Personal Autonomy Support	5.39	.90					.39**	-.13*	.50**
5. Personal Regulatory Style	4.96	1.04						-.08	.29**
6. Discrimination	4.17	1.38							-.16*
7. Collective Efficacy	5.98	.88							

*Note: *p<.01 , **p<.001.* Analyses were conducted using pair-wise deletion.

Table 4. Intercorrelations among collective autonomy, personal autonomy, group power, personal autonomy support, personal regulatory style, discrimination, and collective efficacy (Sample 1c, Manuscript 1)

We next conducted hierarchal linear regression with each sample to test whether 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 collective autonomy into the second step of the model (Table 5).

		Sample 1a		Sample 1b		Sample 1c	
		β	*95% CI*	*β*	*95% CI*	*β*	95% CI
Step 1.							
	Group Power	.26**	.07, .34	.21*	.03, .37	.03	-.08, .12
	Personal Autonomy Support	-	-	.16	-.06, .45	.12*	.01, .28
	Personal Regulatory Style	-	-	.24**	.06, .44	.22***	.11, .32
	Discrimination	-	-	-	-	-.11*	-.16, -.01
	Collective Efficacy	-	-	-	-	.09	-.04, .26
Step 2.							
	Group Power	.07	-.09, .20	.13	-.06, .30	-.02	-.12, .08
	Personal Autonomy Support	-	-	.17	-.03, .46	.12*	.00, .26
	Personal Regulatory Style	-	-	.21*	.02, .40	.20***	.10, .30
	Discrimination	-	-	-	-	.00	-.08, .08
	Collective Efficacy	-	-	-	-	.09	-.04, .25
	Collective Autonomy	0.42***	.25, .62	.22*	.06, .45	.24***	.11, .30

*Note. All covariates were entered into the first step of the regression. Collective autonomy 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.*

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, Manuscript 1.*

As predicted, collective autonomy predicted unique variance in personal autonomy, in Sample 1a, R^2_{change}=.14, $F_{change}(1,120)$=20.83, $p<.001$, Sample 1b, R^2_{change}=04, $F_{change}(1,124)$=6.69, p=.01, and Sample 1c, R^2_{change}=04, $F_{change}(1,361)$=16.67, $p<.001$, after controlling for group power, personal autonomy support, personal regulatory style, collective efficacy and/or discrimination. Thus, together these results provide consistent initial support that collective autonomy is an important and unique factor in relation to people's personal sense of autonomy.

Cross-cultural generalizability. In order to test if collective autonomy was associated with group members' personal autonomy regardless of their cultural background, we re-analyzed our data, this time, accounting for participants' cultural background. Across the three samples, we had a large number of participants from an individualistic culture (America, N=234) and from a collectivistic culture (India, N=254). The remainder of our sample was people from the rest of the world, including the United Kingdom and Eastern Europe (Other, N=131). Our results show that collective autonomy was significantly related to personal autonomy in all three cases: United States (r=.39, p<.001), India (r=.37, p<.001), and Other (r=.18, p=.04). Together, these results indicate that collective autonomy may have important implications for group members' personal sense of autonomy, regardless of their cultural background.

In sum, all three samples provided robust correlational evidence that collective autonomy uniquely predicts the extent to which group members feel personally autonomous, when controlling for factors previously considered within SDT and SIT. Importantly, these results were generalizable across cultures. Thus, overall, Study 1 provides an important foundation for our next series of studies that aimed to provide experimental evidence of a direct link between collective autonomy and personal autonomy.

Study 2

In Study 2, we sought to provide experimental evidence that restricting a group's freedom to determine and practice its own culture (i.e., lack of collective autonomy) would have negative implications for the personal autonomy of individual group members. To test this hypothesis, we developed an immersive laboratory context in which groups created a unique social identity and group culture. We then experimentally manipulated whether group members were free to act in accordance with their newly created culture, and then assessed group members' perceptions of personal autonomy. We hypothesized that members of groups that were not free to act in accord with their own culture (i.e., they lacked collective autonomy) would experience less personal autonomy during the experiment.

We also measured how satisfied group members were when actually 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 tested 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.

Method

Participants. A total of 415 participants took part in the experiment over a two-year period[4]. It was our goal to recruit roughly 400 participants (and 30 groups per condition) to have sufficient

[4] 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, during the second year we delivered instructions to participants using audio/video instructions in the second year in order to increase the consistency of how participants received instructions. For full disclosure, we report the effect of condition on our key outcomes for each sub-year (See Supplemental Analyses 6). Our results were consistent and in the expected direction for all outcomes for both sub-years. Importantly however, we also found that our primary

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 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 key outcomes focused on in the present research. A total of 389 participants (95 groups) were included in our analyses (collective autonomy threat, N= 131, 31 groups; collective autonomy support, N= 120, 30 groups; control condition, N=138, 34 groups; 288 Female, 96 Male; 5 not specified M_{age}=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 3 to 5 people. Because participants who were scheduled to participate in the experiment sometimes canceled, we could not always run the experiment with two groups of equal size[5]. Participants were randomly divided into two groups by drawing slips labeled J and K. After group categorization, participants followed one experimenter into one of two testing rooms in which the remainder of the study took place. Group members did not interact directly with the other group at any point for the remainder of the study.

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results (when utilizing the total sample) did not change when controlling for the year in which the study was run. And furthermore, we found no interaction between condition and year on any outcome. Together, these results indicate that the effect of our manipulation on our outcomes was consistent throughout the two-year data collection period.

[5] 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 7).

Once each group was in their separate room, participants were told what would be involved in the experiment. Participants were told that they would first create a meaningful group identity. Participants were then told that they would play an interactive multiplayer video game, in which group members could control an avatar that would be a direct reflection of their newly created group identity (See Supplementary Materials for complete instructions provided to participants)[6].

Defining a meaningful culture and identity in the lab. To create a meaningful group identity in the lab, participants created a *coat of arms*- a shield adorned with a collection of colours, objects and animals (called charges) that visually symbolize a group's identity. For centuries, people have used coats of arms to symbolize group identities ranging from family lineages to entire nations (Fox-Davies, 1909). Furthermore, there is recent empirical evidence that such symbols of group identity promote group members to perceive their group as a unified and cohesive entity (Callahan & Ledgerwood, 2016). Each group of participants created their coat or arms at one computer, and used an interactive computer program to form their coat of arms (Figure 3). Group members chose between 6 different colours 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 colour 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.

[6] 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.

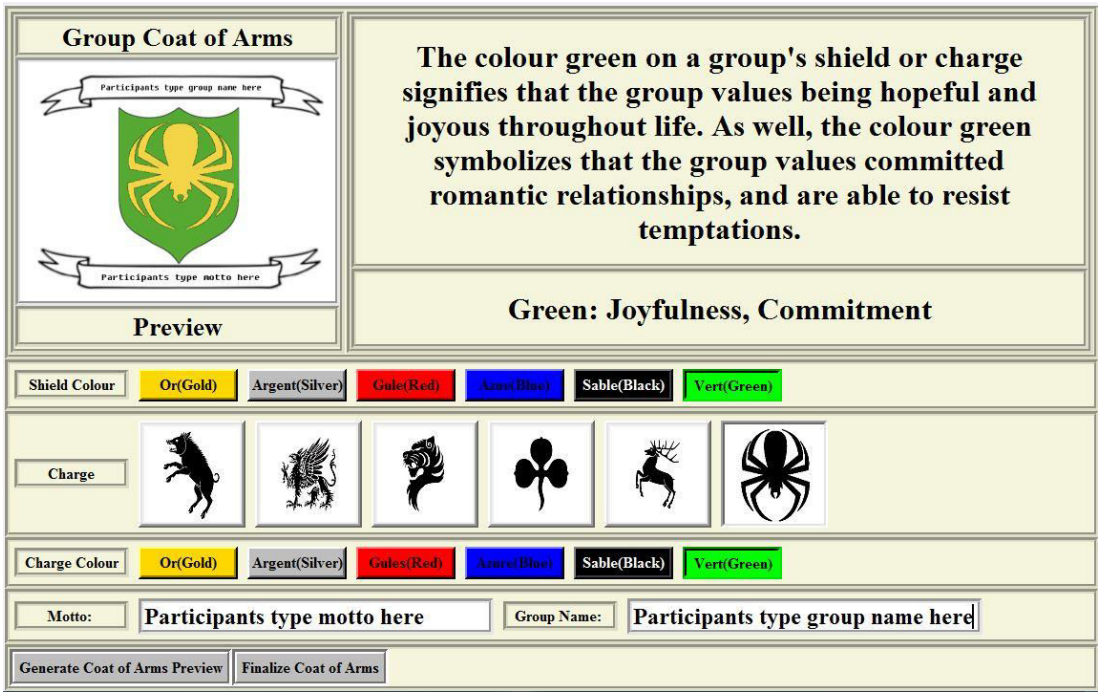

Figure 3. User interface of the coat of arms generator that group members used to form a novel and meaningful identity for their group in Manuscript 1 (Study 2) and Manuscript 2 (Study 3). Note: Groups selected: (1) a color for the background of their shield, (2) a charge for their coat of arms, (3) the color of their shield, (4) a motto for their group, and (5) a name for their group.

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 the identity formation task. 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. For example, if you played a Spiderman game, your experience would be different then if you played a Batman game. So, think carefully about who you are as a group!"* To ensure that potential differences in 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* that allowed participants to practice their culture and act in accordance with their newly formed group identity. The multiplayer video game was programmed 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. Because the in-game avatar was a direct reflection of the group's coat of arms, we operationalized group members' experience controlling their avatar in the game as acting in accordance with one's culture. Each group member played the game at a separate computer in the same lab room. All members of a group were connected virtually in the video game world by use of a LAN network. While participants played the game, they could communicate verbally with other ingroup members. Informal analysis of video footage of group members playing the game during the study revealed that group members frequently interacted with each other during game play. Prior to game-play, group members input their selections of their charge, and the colors of their coat of arms into the game menu screen. Critically, for participants to believe that their coat of arms influenced how they would play the game, the unique abilities of each avatar were ostensibly linked to the charge and colors selected by participants. 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. So that all game-play was identical across conditions, 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.

Figure 4. Game play snap-shot of the interactive video game, Group Quest used in Manuscript 1 (Study 2) and Manuscript 2 (Study 3). 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.

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 to progress through the game, as certain enemies and puzzles could not be completed without all group members working together. The game was programmed to last for 21 minutes. Participants were told that: *"The name of the game is to try and beat as many tasks as you can in*

21 minutes!" Thus, participants attempted to do the best they could by completing as many quests as possible, but were never competing directly with members of the other group.

Experimental Manipulation. Prior to forming their Coat of Arms participants were told that one of the two groups, randomly selected, would be able to look over and alter the coat of arms of the other group (in the collective autonomy threat/support experimental conditions) *or* choose which room in which to conduct the study (in the control condition). In all conditions, participants were always told that the *other* group could either look/change the coat of arms of their ingroup, or, that the other group could choose in which room to conduct the study. Thus, in each condition the outgroup had power over an aspect of the experiment that the ingroup did not have power over. Importantly however, only in the collective autonomy threat/support conditions did the outgroup have the power to undermine the ingroup's freedom to determine and practice its own culture (i.e., collective autonomy).

In the *collective autonomy threat* 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. The experimenter then reentered the room with a modified coat of arms and explained to participants that the outgroup *chose* to alter their coat of arms. The coat of arms was systematically altered by changing the charge, the shield colour and the colour of the charge[7]. Participants were told:

[7] 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.

"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."

In the *collective autonomy support* condition, ingroup members were again told that the outgroup would be able to look over and change their coat of arms. However, in this condition the experimenter returned with an unaltered version of the ingroup's coat of arms. Participants were told:

"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 the *control condition*, 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)[8].

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 of game play. During this time, a pop-up question appeared on the game screen that asked: "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

[8] 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 6, our results did not change when controlling for the year in which the study was conducted.

group members' satisfaction with their identity-based group from their overall enjoyment of the game. Importantly, participants' individual responses to each question were private, and not shown on the screens of other group members. We computed a composite score for each of the three items by taking the mean of the three responses across the 21 minutes of game play (satisfaction with identity aspects of *Group Quest*, α=.83; general enjoyment of *Group Quest*, α=.83).

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)[9]. All items were assessed using a 7-point Likert scale (1=strongly disagree, 7=strongly agree).

Collective Autonomy. Group members' perception of collective autonomy during the experiment was assessed using 11 items (α=.92) that we adapted from our validated scale of collective autonomy (see Study 1). Sample items included: "We were free to determine our own group identity"; "The other group imposed things onto our group's identity" and "We felt pressured by the other group."

Personal Autonomy. As in Study 1, personal autonomy was again assessed using 4 items 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

[9] 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 ingame 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 8). We also sought to differentiate collective autonomy from feelings of group power and perceiving personal autonomy support from members of one's own ingroup. We did not find a significant main effect of condition on group members' perceptions of group power or their perceptions of personal autonomy support from other group members (See Supplemental Analyses 9).

lot of pressures I could do without", "I was free to do things my own way", and "I had to do things against my will" and "I was really doing what interested me", (α=.56).

Results

Means, standard deviations and correlations for all measured variables are summarized in Table 6.

	M	*SD*	1	2	3	4
1. Collective Autonomy	5.77	1.27		.26**	.26**	.08
2. Personal Autonomy	5.29	1.01			.30**	.31**
3. Satisfaction with GQ Avatar	5.17	0.99				.40**
4. Enjoyment of GQ	5.03	1.30				

*Note: *p<.01 , **p<.001.* Analyses were conducted using pair-wise deletion.

Table 6. Intercorrelations between collective autonomy, personal autonomy, satisfaction with one's Group Quest avatar, and their enjoyment of Group Quest, across experimental conditions of Study 2, Manuscript 1.

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, Bolin, & Kelley, 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. We used restricted maximum likelihood (REML) which is considered most accurate for estimating multilevel models (Kreft & De Leeuw, 1998) and is ideal when the level 2 sample size is limited (Mass & Hox, 2005). Multilevel 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. We repeated all analyses using a traditional linear (ordinary least squares) model and found an identical pattern of results for all outcomes (see Supplementary Analyses 7).

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 collective autonomy we found a large ICC, (ICC=.52, 95% *CI* [49, .54]), 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 (when rounding to the thousandth decimal), indicating that the unique group to which participants were assigned to did not impact their personal autonomy. The ICCs for group members' personal satisfaction with their avatar, (ICC=.20, 95% *CI* [.11, .33]), and their personal enjoyment of group quest (ICC=.17, 95% *CI* [.07, .35]) were statistically significant yet also relatively smaller than for the collective autonomy outcome.

Manipulation Check. Analyses revealed that our collective autonomy threat manipulation was successful. As expected, participants in the collective autonomy threat condition (M=4.46, SD=1.13) reported significantly less collective autonomy than participants in the control condition (M=6.45, SD=.74), γ=1.99, 95% *CI* [1.78, 2.20], $t(386)=18.82$, $p<.001$, and participants in the collective autonomy support condition (M=*6.41, SD*=.64), γ=1.94, 95% *CI* [1.73, 2.16], $t(386)=17.74$, $p<.001$. Participants in the collective autonomy support condition did not differ in perceived collective autonomy relative to participants in the control condition, γ= -.05, 95% *CI* [-.26, .17], $t(386)=-.43$, $p=.66$. Relative to the null model, adding the fixed effect of condition (inputted as two dummy coded variables) significantly improved the model fit, $\chi^2=166.10$, $p<.001$, $R^2_{level}=.51$. In sum, group members who lost their collective autonomy

reported significantly lower collective autonomy 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 Ingame Avatar. We next tested our basic assumption that group members would 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 threat condition (M=4.87, SD=.99) reported significantly less satisfaction with their in-game avatar than participants in the control condition (M=5.27, SD=.91), γ=.40, 95% *CI* [.16, .63], $t(88.51)=3.26$, $p=.002$, and participants in the collective autonomy support condition (M=5.38, SD=1.02), γ=.51, 95% *CI* [.27, .78], $t(88.65)=4.06$, $p<.001$. There were no significant differences in satisfaction between group members in the collective autonomy support condition and the control condition, γ=.11, 95% *CI* [-.12, .34], $t(91.88)=.92$, $p=.36$. Relative to the null model, adding the fixed effect of condition significantly improved the model fit, $\chi^2=17.43$, $p<.001$, $R^2_{level}=.10$. Providing some specificity for these results, 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, $\chi^2=2.17$, $p=.34$, $R^2_{level}=.00$. 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 threats to 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 threat condition (M=5.09, SD=1.09) reported feeling significantly less personal

autonomy during the experiment than participants in the control condition (M=5.37, SD=.97), γ=.28, 95% *CI* [.04, .52], $t(386)=2.27$, p=.02, and significantly less personal autonomy than participants in the collective autonomy support condition (M=5.40, SD=.94), γ=.31, 95% *CI* [.06, .56], $t(386)=2.43$, p=.02. However, there were no significant differences in personal autonomy between group members in the collective autonomy support condition and the control condition, γ=.03, 95% *CI* [-.22, .28], $t(386)=2.43$, p=.81. Relative to the null model, adding the fixed effect of condition significantly improved the model fit, χ^2=7.39, p=.03, R^2_{level}=.01.

Discussion

Building on the results from Study 1, Study 2 provided experimental evidence that threats to a group's collective autonomy may undermine the extent to which individual group members feel personally autonomous. Indeed, when an outgroup took away the freedom of one's group to determine its identity and practice its culture, feelings of personal autonomy were undermined. Furthermore, Study 2 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.

Interestingly, the random effect of participants' unique group on group members' perceived collective autonomy was relatively larger than the group effect on group members' personal perceptions of autonomy, and their satisfaction with their in-game avatar. The large effect of group on collective autonomy (a manipulation check) is likely due in part to all members of a unique group being assigned to the same collective autonomy condition. Anecdotal evidence from the video recordings revealed that to varying degrees, group members would verbally express with each other their reaction to the outgroup's decision to allow their ingroup to keep (or not) their coat of arms. Thus, such intragroup discourse concerning the collective

autonomy threat may have contributed to group members' perception of their collective autonomy being interrelated with the other members of their unique group. In contrast, the smaller group effect on personal autonomy and group members' satisfaction with their in-game avatar may be due to participants not necessarily discussing their perceptions of personal autonomy or their satisfaction with their in-game avatar explicitly with other group members, as they did the state of their group's collective autonomy.

Furthermore, while perceptions of collective autonomy directly reflected the state of the group that is shared by all group members, the other outcomes reflected perceptions of the self, rather than of the group. Thus, it follows that group members reported perceptions of personal autonomy, and their satisfaction with their avatar would be less inter-correlated than their perceptions of the group's shared collective autonomy. The relatively large ICC for collective autonomy is theoretically important as it demonstrates that although collective autonomy is a subjective perception held by group members, there is likely be some consensus among group members about the state of the group's collective autonomy. This supports the notion that when a group's collective autonomy is threatened, to varying degrees, most members within the group will be attuned to that threat. Such shared, collective experiences of collective autonomy threat may in turn have implications for how the group may respond collectively to such threats. Yet, most critical to the present research is the result that our manipulation of collective autonomy significantly impacted group members' personal autonomy and their satisfaction with in-game avatar when accounting for the random group effects of participants' unique group.

It is important to acknowledge limitations of the present study. 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. We addressed this limitation in Study 3.

Study 3

Study 3 built on the previous two studies by experimentally manipulating collective autonomy with respect to real-world cultural groups. We focused on cultural, racial, ethnic and religious identities given previous research demonstrating the important role of such identities for informing the self-concept (Taylor, 2002; Usborne & Taylor, 2010). A second objective of Study 3 was to test whether by undermining one's personal autonomy, threats to collective autonomy may also have negative downstream consequences for the psychological wellbeing of group members. For obvious reasons, it would be impossible to actually restrict the collective autonomy of an entire real-world cultural group. Thus, we used a narrative writing manipulation (e.g., Usborne & Taylor, 2012) in order to induce group members to feel, at least momentarily, that their group either had or lacked collective autonomy during its history. We hypothesized that having group members write about an event in their group's history wherein their group lacked (rather than had) collective autonomy would temporarily undermine their own personal autonomy. Furthermore, we hypothesized that our writing manipulation would also have a

significant indirect effect on group members' psychological wellbeing, as a consequence of its direct effect on personal autonomy. Akin to Study 1, we tested these hypotheses with respect to people's self-generated "core cultural group", which consisted of a racial, ethnic, national and/or religious identity.

Method

Participants. Four hundred and sixty-seven participants[10] were recruited for the study using two crowdsourcing networks: Crowdflower (n=331) and Mturk (n=136)[11]. Participants were randomly assigned to either describe a time when their core cultural group had collective autonomy (collective autonomy threat condition, n=225) or lacked collective autonomy (collective autonomy support 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 assessed[12] (n=121), attempting to

[10] 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_{total}=372, N_{Final}= 257, 69% 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 many 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 neutral with respect to collective autonomy, we excluded participants in this condition from our main analyses. Supplemental Analyses 10 replicate the main analyses when including all three conditions.

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[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

complete the survey multiple times (N=18), failing to complete the writing task, copy and pasting a response from the Internet rather than formulating their own response (N=44), 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 wellbeing, n=2). A total of 273 participants remained (males=157, females=115, other=1; *M* age=33.42, SD=10.85). The percentage of participants by condition who passed our inclusion criteria is as follows: collective autonomy threat condition=129, 57% included; collective autonomy support condition=144, 60% included. The final sample is distributed as follows: 35.10 % of the final sample resided in the United States, 31.40 % resided in India and 33.60 % 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 the sample, participants named 94 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 detailed description).

Participants in the collective autonomy support 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*

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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 all 121 participants who missed the three key attention checks. Our results did not change significantly when including participants, regardless of whether they missed the attention checks: condition continued to have a significant effect on collective autonomy, $F(1,345)=19.49$, $p<.001$,$\eta^2=.05$, personal autonomy, $F(1,346)=5.14$, $p=.02$,$\eta^2=.015$, and a significant indirect on psychological wellbeing, *indirect effect*= .10, *SE*=.05, 95% CI=[.02, 20].

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 threat 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)[13], which included the scales assessing the key outcomes of the study:

Collective autonomy: Collective autonomy was assessed using the same 16-item scale used in Study 1 (α=.89).

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

Psychological wellbeing. Following the approach of Chirkov and colleagues (2003), psychological wellbeing was assessed as a composite score of: *Diener's life satisfaction scale*

[13] We again assessed four constructs that may potentially overlap with collective autonomy: Participants' regulatory style for acting in accordance with their culture, personal autonomy support from ingroup members, perceived discrimination, and group power. Providing evidence that collective autonomy is a distinct construct from other potentially overlapping constructs with SDT and SIT, we found that there was no significant unique main effect of condition on group power, personal autonomy support, personal regulatory style, or discrimination when controlling for collective autonomy. Describing instances of collective autonomy threat did heighten group members' perceptions of discrimination (relative to group members who described instances of collective autonomy support), however this effect became non-significant when controlling for collective autonomy. Furthermore, mediation analyses utilizing PROCESS (model 4) found that condition impacted perceptions of prejudice via reductions in perceived collective autonomy (See Supplemental Analyses 11 for detailed results).

(Diener, Emmons, Larsen, & Griffin, 1985; α=.89); *the short index of self-actualization* (Jones & Crandall, 1986; α=.65); *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 wellbeing was computed by taking the mean of the standardized scores of each individual measure (α=.81).

Results

Descriptive statistics of the key study outcomes and correlations collapsing across the collective autonomy threat and collective autonomy support conditions are presented in Table 6.

	M	*SD*	1	2	3
1. Collective Autonomy	4.48	1.07	.	.51**	.26**
2. Personal Autonomy	4.90	1.14			.55**
3. Psychological Wellbeing	.00	.80			

*Note: *p<.01 , **p<.001.* Analyses were conducted using pair-wise deletion.

Table 7. Intercorrelations between collective autonomy, personal autonomy, and psychological well-being, across experimental conditions of Study 3, Manuscript 1

Manipulation check. One-way analysis of variance (ANOVA) revealed a significant main effect of writing condition on participants' perception of their core cultural group's collective autonomy, $F(1,271)=17.74$, $p<.001$, $\eta^2=.06$. As expected, participants who described a time in their group's history in which their group had collective autonomy ($M=4.73$, $SD=.10$) perceived that their core cultural group had significantly greater collective autonomy relative to participants who described a time in their group's history in which their group *lacked* collective autonomy, ($M=4.20$, $SD=1.01$). These results indicate that our writing manipulation was

effective in inducing participants to momentarily feel relatively higher or lower levels of collective autonomy.

Personal Autonomy. One-way analysis of variance revealed a significant effect of writing condition on participants' subjective feelings of personal autonomy, $F(1,271)=3.85$ $p=.05$, $\eta^2=.014$. Supporting our hypothesis, participants in the collective autonomy threat condition reported significantly lower personal autonomy (M=4.76, SD=1.20) relative to participants in the collective autonomy support condition (M=5.03, SD=1.08).

Psychological Wellbeing. One-way ANOVA revealed no significant main effect of condition on psychological wellbeing, $F(1,271)=1.79$, $p=.18$,$\eta^2=.007$, although the results trended in the expected direction. Participants in the collective autonomy threat condition (*M*=-.07, *SD*=.80) reported less wellbeing relative to participants in the collective autonomy support condition (*M*=.06, *SD*=.79), although this difference was not significant. Even though the direct effect of writing condition on psychological wellbeing was non-significant, Kenny and Judd (2014) argued 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 wellbeing indirectly as a result of its direct impact on personal autonomy. As such, we performed mediation analysis with PROCESS (Hayes, 2013; model #4) using 5,000 bootstrapping samples, to examine if condition had a significant indirect effect on psychological wellbeing through personal autonomy. Supporting this hypothesis,

analyses revealed a significant indirect effect of condition on psychological wellbeing through personal autonomy, *b*=.10, *SE=.05, 95% CI* [.003, .21].

Discussion

Study 3 provided clear experimental evidence with real-world cultural groups that group members' perceptions of collective autonomy have a direct impact on their personal autonomy. When group members described an intergroup context in which their core cultural group lacked collective autonomy they reported significantly less *personal* autonomy as individuals. Furthermore, building on the first two studies, Study 3 elucidates the downstream implications of collective autonomy on psychological wellbeing. That is, describing events in which one's group lacked collective autonomy had negative downstream consequences for psychological wellbeing, as a consequence of its effects on personal autonomy. Thus, these results broaden the implications of the first two studies by providing some causal evidence that thinking about important cultural groups as having, rather than lacking, collective autonomy may be essential for maintaining a sense of personal autonomy as an individual, and an overall sense of psychological wellbeing.

General Discussion

Feeling personally autonomous is essential for maintaining optimal psychological wellbeing and volitional motivational states that are conducive to living a happy and fulfilling life (e.g., Chirkov et al., 2011; Deci & Ryan, 2008; Sheldon, 2014). In the present research, we introduce a novel factor – people's perception of their group's collective autonomy in an intergroup context- which may impact the extent to which individuals feel personally autonomous. Across three different research contexts, we consistently found that group members' subjective perception of their group's collective autonomy was directly and positively

related to their own personal sense of autonomy. Furthermore, this relation was maintained when statistically controlling for potentially overlapping factors that have previously been considered within self-determination theory (Deci & Ryan, 2000) and social identity theory (Tajfel & Turner, 1979).

Beyond its direct implications for personal autonomy, we also found that collective autonomy had consequences for group members' psychological wellbeing. We provided experimental evidence indicating that group members who were primed to experience lower levels of collective autonomy also experienced lower personal psychological wellbeing, as a direct consequence of feeling less personal autonomy. Finally, we provided experimental evidence that group members prefer to behave in accord with the values, customs and practices of their own self-determined culture as opposed to those that may be imposed forcefully upon their group.

Based on these results, an important theoretical question arises: Does the need to feel collectively autonomous constitute a universal and basic psychological need of group members? Indeed, self-determination theory proposes that personal autonomy constitutes a universal and basic psychological need given its robust, unique, and universal association with wellbeing (Deci & Ryan, 2000). Presently, we do *not* conceptualize collective autonomy as a basic psychological need in and of itself, as may be the case for personal autonomy. Indeed, the impact that collective autonomy has for wellbeing 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 impacted 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 wellbeing would be needed before

making the claim that collective autonomy constitutes a basic psychological need in and of itself (Ryan, 1995). Instead, because of the consistent and cross-cultural evidence that we provide linking collective autonomy to personal autonomy, we propose that collective autonomy should be conceptualized as an important nutrient that promotes individuals to feel personally autonomous. This view parallels how receiving personal autonomy support, and having personally autonomous reasons for behaving have also been described as critical nutrients for personal autonomy (Vansteenkiste & Soenens, 2015). Furthermore, we propose that collective autonomy can be conceptualized as a *collective need* for group members insofar as maintaining collective autonomy is necessary for group members to feel personally autonomous.

Implications for Self-Determination Theory and Social Identity Theory

The concept of collective autonomy may have important implications for SDT (Deci & Ryan, 2000; Ryan & Deci, 2000a). Our findings do not discount the critical importance of receiving personal autonomy support from other ingroup members for personal autonomy and psychological wellbeing. Nor do we deny the important role that holding fully internalized and autonomous reasons for practicing one's culture has for promoting personal autonomy and psychological wellbeing (Chirkov et al., 2003). Rather, our findings extend self-determination theory by introducing people's perception of their social groups' autonomy within an intergroup context. Specifically, we highlight that it is not only important for individual group members to feel that their personal autonomy is supported and respected by others within their social group, but also, to feel that other groups have respected the collective autonomy of their social groups.

The present research may also have important implications for SIT (Tajfel & Turner, 1979). Research conducted within the social identity tradition has repeatedly demonstrated that the manner in which people construe and evaluate their self-concept is influenced in part by their

social (cultural) identities (Jetten et al., 2015; Oyserman, 2007; Taylor, 1997; Usborne & Taylor, 2010, 2012). Such previous work has linked social identities to people's personal identity clarity (Usborne & Taylor, 2010), long-term goals and aspirations (Oyserman, 2007), self-esteem (Jetten et al., 2015; Luhtanen & Crocker, 1992) and their perceived locus of control (Greenaway et al., 2015; Tiessen, Taylor, & Kirmayer, 2009). Our research adds personal autonomy as another important individual outcome that is inherently linked to one's social identity. Furthermore, our findings introduce collective autonomy as a novel and important social identity factor to be considered in relation to psychological wellbeing, beyond factors previously considered by SIT such as, for example, the link between wellbeing and perceived discrimination (Branscombe et al., 1999; Sellers et al., 1998).

Implications for Intergroup Relations

At a societal level, our research speaks 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. In such contexts, it is possible that social groups with different cultures may not always agree in terms of 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 as unacceptable, it may in turn 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 as to the underlying

psychological mechanism for why group members may feel threatened by such restrictions being placed upon how they practice their culture. Namely – such restrictions might challenge their collective autonomy and in turn, thwart their basic psychological need to feel personally autonomous.

Through our discussion of collective autonomy, we do not imply that it is acceptable for social groups to engage in cultural practices that may have serious adverse consequences for the psychological and/or physical wellbeing of ingroup members. Nor do we imply that outside groups should *never* intervene if they see members within 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 undermine the collective autonomy of other outgroups, and in fact may backfire, causing more intergroup tensions. 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).

Thus, if groups do attempt to provide other groups with their opinion for how they should practice their own culture, we argue that the intervening group must do so in a collective autonomy-supportive manner. Autonomy-supportive approaches at an intergroup level can be informed by conceptualizations of autonomy support at the interpersonal level (e.g., Williams et al., 1996). For example, collective autonomy support may involve the intervening group acknowledging the emotions and perspectives of the other group, and carefully explaining their position for why they do not agree with the customs and practices of the other group. Ultimately,

the intervening group must respect and acknowledge the choice of the other group to determine its own culture in its own way (Kachanoff, Caouette, Wohl, & Taylor, in press). For example, recent research has shown the potential constructive effects of collective autonomy-supportive language within an intergroup apology for promoting reconciliation between groups (Kachanoff et al., in press). Further applied research will be needed to operationalize and formalize how collective autonomy support may function at an intergroup level, and within various intergroup contexts that may benefit from such interventions. Doing so may have profound implications in intergroup contexts such as that of France, in which groups with different cultural backgrounds attempt to understand and respect each other's culture, while working together to share the global community.

In future research, it may also be important to examine how collective autonomy support may help resolve present or historical intergroup conflicts. Specifically, collective autonomy support may be especially vital when power differences exist between groups. In intergroup contexts of asymmetric power, low-power group members may fear that their collective autonomy will be undermined as a result of their low power position. Thus, the high-power group may need to explicitly affirm and respect the collective autonomy of the low-power group to promote positive intergroup relations in these contexts. This view complements the work of Shnabel and colleagues who have highlighted the importance of high-power groups affirming the agency of low-power groups during intergroup conflict as a means of promoting reconciliation (e.g., Shnabel et al., 2009; Simontov-Nachielli & Shnabel, 2014). Building on this literature, we show that affirming the low-power group's freedom to determine and practice its own culture may promote positive intergroup relations as it will ensure that low-power group members do not

feel that their basic psychological need to feel personally autonomous is threatened by the outgroup.

Caveats

While the findings of both Study 2 and Study 3 both clearly and consistently show that the experimental manipulations of collective autonomy significantly impacted group members' general perceptions of personal autonomy, it is possible that other factors, such as group members' personal life circumstances may have also impacted their personal autonomy ratings. In the present work we assessed personal autonomy in a broad and general sense with respect to participants' daily experiences (Study 1 and Study 3) or within the broad context of the lab experiment (Study 2). Future work might assess group members' personal autonomy specifically with respect to their experiences as group members within their intergroup context, rather than personal autonomy in a general sense. We would expect that a more context-specific measure of personal autonomy would be more sensitive to the potential impact of collective autonomy threat on group members' personal autonomy. However, a strength of the more generalized personal autonomy measure utilized in the present research is that it provides compelling evidence that threats to a group's collective autonomy may adversely affect group members' basic experiences of personal autonomy during their everyday lives.

Conclusion

Across three studies we provide robust evidence that collective autonomy is a novel factor with important implications for personal autonomy and psychological wellbeing. 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.

TRANSITION TO MANUSCRIPT 2

Manuscript 1 provides correlational and experimental evidence that people are better able to satisfy their basic psychological need for personal autonomy within an intergroup context in which the collective autonomy of their social group is supported, rather than restricted. The positive relation between collective autonomy and personal autonomy was robust across individualistic (Western-based) cultures and collectivistic (Eastern-based) cultures. Furthermore, the relation between collective autonomy and personal autonomy was maintained when controlling for potentially overlapping variables previously considered within self-determination theory (personal autonomy support, personal regulatory style) and social identity theory (group identification, distinctiveness, collective efficacy, collective control, group power, and perceived discrimination). Importantly, because of its impact on personal autonomy, experiencing collective autonomy also promoted group members to experience greater psychological well-being.

While Manuscript 1 considers the consequences of collective autonomy for the psychological health of individuals group members, in Manuscript 2, I turn attention to how collective autonomy might impact the relations between groups. Specifically, I investigate how members of low-power groups might respond if they feel that their collective autonomy has been restricted, rather than supported, by a high-power outgroup. I focus specifically on low-power group members in Manuscript 2 because as a function of their low-power position, low-power group members are most prone to having their collective autonomy restricted by other outgroups. Indeed, because low-power groups lack influence and may be dependent on high-power groups, they may be prone to falling under the undue influence and control of high-power groups. I argue that if experiencing collective autonomy has such important psychological consequences for

group members (documented in Manuscript 1), then group members will become highly motivated to restore their group's collective autonomy when it is restricted. Thus, I hypothesize that restrictions to a low-power group's collective autonomy will mobilize low-power group members to pursue more power for their group and engage in collective action as a means of restoring their collective autonomy. In contrast, I hypothesize that when low-power groups are permitted by the high-power group to enjoy collective autonomy, they will be more prone to justify their existing social system, even if their group is other-wise disadvantaged within that system. I test these hypotheses across 4 studies, both within the context of real world groups, and artificially constructed groups in the laboratory.

MANUSCRIPT 2: Determining our Destiny: Do Restrictions to Collective Autonomy Fuel Disadvantaged Group Members' Desire for Power?

Kachanoff, F.J., Kteily, N., Khullar, T.H., Park, H.J., Taylor, D.M., (2017). Determining our destiny: Do restrictions to collective autonomy fuel disadvantaged group members' desire for power? (Manuscript submitted to *Journal of Personality and Social Psychology*).

Abstract

Threats to collective autonomy arise when one group restricts another group's freedom to define and practice its own culture. We hypothesized that low-power group members would desire group power, support and engage in collective action, and challenge their social system to a greater extent when their collective autonomy was restricted rather than supported by a high-power group. Four studies supported this hypothesis. In Study 1 (N=370) the extent to which individuals felt that their cultural group lacked collective autonomy was positively associated with their desire for group power and negatively associated with system justification. In Study 2 (N=311), Black Americans' perception that their collective autonomy was restricted was associated with greater support for collective action, and negatively associated with system justification. In Study 3 (N=394), low-power group members who had their collective autonomy restricted, desired group power to a greater extent than low-power group members who had their collective autonomy supported. In Study 4 (N=346) we independently manipulated whether (1) low-power groups had their collective autonomy supported or restricted, and (2) whether low-power groups were treated equally or unequally. Whether groups were treated equally or exploited by the high-power group, experiencing restrictions to collective autonomy (versus collective autonomy support) increased low-power group members' support of collective action and decreased system justification. Across all studies, we highlight collective autonomy as a novel route to collective protest, differentiating it from other relevant factors such as discrimination, group identification, system stability and permeability, and resource deprivation.

Introduction

"Black Power is giving power to people who have not had power to determine their destiny."

Huey P. Newton, 1968

Some of the most salient responses to disempowerment involve instances of low-power groups engaging in historically significant mass social protests to achieve their aims. The United States' social climate in the 1960s was defined by the Black Civil Rights movement in which thousands of Black activists pushed for group empowerment. In South Africa, the resistance to Apartheid involved both violent and non-violent collective action ranging from mass work strikes and student demonstrations, to guerrilla warfare. Similarly, Palestinians have waged both violent and non-violent struggles for power in their conflict with Israel for almost 70 years. The magnitude and frequent bloodiness of such power struggles heightens their psychological prominence and contributes to the impression that collective action by low-power groups is the rule rather than the exception. Low-power groups, however, refrain surprisingly often from engaging in collective initiatives to pursue more power for their ingroup (Jackman, 1994; Jost & Banaji,1994; Jost, Banaji & Nosek, 2004). Indeed, as Jackman (1994) famously observed, both high and low power groups often act in a seemingly coordinated manner to minimize the likelihood of intergroup conflict. Given this paradox, a central question has emerged within the field of intergroup relations: "What is it that mobilizes people to participate in social protest?" (Van Zomeren, Postmes, & Spears, 2008, p. 504).

Contributing to this broader question, the present research examines the unique role of a novel factor, *collective autonomy,* which we argue impacts whether low-power groups will mobilize and engage in collective action, or rather, acquiesce to their disadvantaged position. Collective autonomy involves group members' perception that their group is free to determine

and practice its own identity, culture, and collective agenda, and that it is not controlled or repressed by other groups (Kachanoff, Caouette, Wohl, & Taylor, 2017; Kachanoff, Taylor, Caouette, Khullar, & Wohl, under review). Herein, we test the hypothesis that having their collective autonomy restricted (vs. supported) encourages groups to push for group empowerment, challenge the existing social system, and engage in collective action. Notably, we also propose that receiving collective autonomy support can sometimes contribute to acquiescence in the face of disempowerment. We root this theorizing in past research demonstrating that: (1) individuals have a basic psychological need to feel personally autonomous (Ryan & Deci, 2017); (2) feeling collectively autonomous is key to satisfying this basic need for personal autonomy (Kachanoff et al., under review); and (3) power is essential for individuals and groups to maintain their autonomy (Lammers, Stoker, Rink, & Galinsky, 2016; Pratto, 2016). Integrating this previous work, we reason that because collective autonomy is vital to the satisfaction of individuals' basic psychological need for autonomy, group members will be motivated to restore their collective autonomy when it is threatened. To this end groups will seek to improve their power position by challenging the existing social system and engaging in collective action. Conversely, given its centrality, having the ingroup's collective autonomy supported can ameliorate the motivating thrust of other grievances rooted in disadvantage, thereby promoting acquiescence.

Collective Autonomy Threat and Mobilizing for Power

The pursuit of collective autonomy has featured heavily in many disadvantaged groups' struggles for power. Indeed, collective autonomy was the first and most prominent point that the Black Panthers (leaders of the Black Power movement) listed in their famous ten-point program outlining the group's objectives. Specifically, the party announced, "We want freedom. We want

power to determine the destiny of our Black community" (Black Panther Party, 1966). For leaders of the Black Power movement, such as Huey P. Newton, having power was first and foremost a necessary prerequisite for achieving Black self-determination and Black freedom. Similarly, Palestinians have described their fight for *self-determination* (Said, 2012) as being in part a fight for the freedom to express and maintain their Palestinian culture (Al Ghussain, 2016).

What is it about lacking collective autonomy that makes it such a seemingly important motivator of collective action? At the individual level, self-determination theory, a macro theory of human motivation and well-being, proposes that people are motivated to satisfy three universal and basic psychological needs – one of which is the need to feel personally autonomous (Ryan & Deci, 2017). Experiencing *personal* autonomy involves feeling a sense of volition over one's actions, and a sense of behaving in accordance with one's self-defined, authentic, and "true" self (Deci & Ryan, 2000; Sheldon, 2014; Weinstein, Przybylski, & Ryan, 2012). Decades of research provide robust cross-cultural evidence that feeling personally autonomous is essential for experiencing psychological well-being (e.g., Chirkov, Ryan, Kim, & Kaplan, 2003; Deci & Ryan, 2000; Ryan & Deci, 2017).

Importantly, one determinant of our sense of personal autonomy appears to be the collective autonomy our *group* enjoys (or lacks). Indeed, Kachanoff and colleagues (under review) find that individuals' perception that their groups are autonomous (i.e., experiencing collective autonomy) is positively associated with their sense of personal autonomy and has downstream positive consequences for psychological well-being. Furthermore, the unique effect of collective autonomy on personal autonomy and psychological well-being holds even when controlling for several potentially overlapping constructs, including perceived discrimination, collective efficacy, collective control and group identification.

Given the psychological necessity of personal autonomy and the central role that collective autonomy serves in ensuring it, we propose that group members will be strongly driven to regain their collective autonomy when it comes under threat. Importantly, we argue that under conditions of threat to their collective autonomy, low-power groups may pursue more power for their group in order to restore collective autonomy, including engaging in collective action.

Group power pertains both to a group's capacity to influence other groups, and to remain relatively immune from the control and influence of other groups (Keltner, Gruenfeld, & Anderson, 2003; Pratto, 2016; Pratto, Pearson, Lee, & Saguy, 2008). Although group power and collective autonomy are psychologically distinct, a group's collective autonomy may be jeopardized when it lacks power. Because groups that are high in power tend to have greater levels of independence, they should be relatively free to behave according to their chosen norms and practices (i.e., to satisfy their own need for collective autonomy). On the other hand, by virtue of their relative dependence, groups that lack power are at the mercy of high-power groups when it comes to ensuring their collective autonomy is respected; that is, powerful groups can choose whether or not to allow low-power groups the ability to determine and practice their own culture. At the individual level, there is evidence that low-power individuals desire to increase their personal power specifically when they lack rather than maintain their personal autonomy (Lammers et al., 2016). Specifically, Lammers and colleagues demonstrated that experimentally threatening people's personal autonomy led to greater motivation for personal power, but taking away people's influence over others did not increase their power motivation. We argue that the same will hold true at the group level: low-power groups who lack influence and resources will desire power more when their group experiences collective autonomy threat (vs. support).

Collective Autonomy Support and System Justification

Although lacking power is a 'risk factor' heightening the potential for restrictions to one's collective autonomy, it is important to make a distinction between collective autonomy and (a lack of) power. Belonging to a low-power group in society does not guarantee that one will actually experience restrictions to collective autonomy. At the interpersonal level, substantial research shows that high-power individuals (e.g. doctors, parents, teachers, bosses) often support the personal autonomy of lower-power individuals (patients, children, students, employees) by conveying well-meaning direction to the low-power individual, while at the same time actively supporting the personal choices of the low-power individual (Niemiec et al., 2006; Reeve & Jang, 2006; Williams et al., 2006). The same appears true at the intergroup level: *Collective autonomy support* is possible when a high-power group respects a low-power groups' autonomy by giving their members the space and the freedom to determine and practice their own culture (Kachanoff et al., under review). For example, many major North American cities contain districts inhabited predominantly by one specific ethnic minority (e.g., China Town, Little Italy). In such districts, and oftentimes with the enthusiastic support of the city at large, members of the ethnic minority group openly express and practice their culture, for example by developing architecture reflecting that of their homeland, along with places of worship, community centers and shops that feature the group's food and decorative preferences.

In the present research we propose that when low-power groups have their collective autonomy supported (rather than restricted) by the high-power group, they will become less willing to challenge the other forms of disadvantage that are harmful to their group such as the lack of societal influence and deprivation of scarce resources which may stem from lacking power. For example, after years of Indigenous peoples in Canada being prevented from

determining and practicing their own heritage culture, their freedom to determine and practice their own culture has been at last officially recognized and celebrated (Truth and Reconciliation Commission of Canada, 2015). At the same time however, Indigenous peoples are still a highly disadvantaged group in Canadian society, with many Indigenous communities having minimal influence over Canadian policy, suffering from high rates of unemployment, and lacking proper access to housing and clean drinking water (Taylor & de la Sablonnière, 2014). It may be that low-power groups, such as Indigenous peoples, continue to be disadvantaged because the collective attempts that they do engage in to improve their situation may ultimately prove unsuccessful. Yet, we suggest that another contributor might be the effect that ostensibly benevolent actions from the high-power group have in reducing the willingness of the low-power group to engage in collective action, and increasing their tendency to justify their present social system (see e.g., Jackman, 1994; Jost, Becker, Osborne, & Badaan, 2017). Specifically, we argue that collective autonomy support from the high-power group may be especially effective in getting low-power group members to justify their social system.

System justification theory (SJT; Jost & Banaji,1994; Jost et al., 2004) has explained the fact that low-power group members are sometimes reluctant to challenge their social system on the basis of their motivation to perceive that the world is just and fair. Specifically, SJT proposes that by justifying the existing social system, individuals can satisfy basic underlying psychological epistemic, existential and relational needs (Hennes, Nam, Stern, & Jost, 2012; Jost, et al., 2017), such as the needs for cognitive closure, structure, physical safety, and social connectedness (Hennes et al., 2012). We do not discount the important role of such needs in driving system justification. However, we argue, on the basis of self-determination theory (Ryan & Deci, 2017), that the extent to which one's social system allows group members to satisfy their

basic psychological need for personal autonomy by maintaining their collective autonomy as a group will also predict system justifying tendencies. Congruent with this hypothesis, self-determination theory has argued that when group members are controlled and oppressed within their *own* cultural or political group it will be difficult for them to legitimize their own ingroup. For example Ryan and Deci (2017) argue that, "cultural, political, or economic factors that can not be readily internalized and that represent barriers to basic need satisfaction, result in their being perceived as illegitimate or oppressive" (p.614). We contend that the same holds true in an *intergroup* context: It will be difficult for group members to justify a social system in which their group's collective autonomy is not supported by other groups in their society because such a system will violate group members' basic need for personal autonomy. The converse should also be true: when a group's collective autonomy *is* supported and their basic need for personal autonomy thereby satisfied, group members will be less motivated to mobilize or change the social system.

Our theorizing is also congruent with Jackman's (1994) notion that the paternalistic treatment of low-power groups by high-power groups contributes to acquiescence. In her model, Jackman (1994) describes paternalistic behaviors as involving the high-power group acting in a helpful, overly kind, complimentary, and patronizing way to the low-power group. Providing support for this model, Becker and Wright (2011) demonstrate that in contrast to hostile sexism, exposure to *benevolent* sexism— the belief that women are more moral and affectionate than men, and should be protected by them— actually dissuades women from supporting collective action. More broadly, there is growing evidence that positive intergroup contact with members of an advantaged high-power group might dissuade disadvantaged low-power group members from supporting collective action (Becker, Wright, Lubensky, & Zhou, 2013; Dixon, Tropp,

Durrheim, & Tredoux, 2010; Saguy & Kteily, 2014; Wright & Lubensky, 2009). Building on this research, we contend that, by satisfying group members' psychological need for personal autonomy, collective autonomy supportive behaviors on the part of the outgroup increase system justification and reduce collective action motives among low-power groups.

Overview of Present Research

We tested our hypotheses across two studies with real-world groups, and two laboratory experiments. Across these studies, we sought to establish the uniqueness of collective autonomy's role beyond other important factors known to be linked to group members' desire for power, support for collective action, and tendency to justify the existing social system. For example, feeling discriminated against and disliked by other groups is positively associated with support for collective action (Kteily, Hodson, & Bruneau, 2016; Moghaddam & Perault, 1992). We thus controlled for this factor in Study 1. Furthermore, perceptions of the social hierarchy as unstable (e.g., Mummendey, Kessler, Klink, & Mielke, 1999), illegitimate (e.g., Rabinowitz, 1999) and impermeable (Wright, Taylor, & Moghaddam, 1990) also promote collective action; we therefore controlled for these sociostructural factors in Study 2. Across the four studies, we also took into account individual difference factors previously associated with low-power group members' willingness to engage in collective action and to challenge their social system, namely group identification (e.g., Giguère & Lalonde, 2010; Stürmer & Simon, 2009), and social dominance orientation (Ho et al., 2015). Lastly, we controlled for group members' general prejudice towards the outgroup (Tajfel & Turner, 1979)[14]. Paralleling research by Lammers and colleagues (2016) at the individual level, we sought to differentiate collective autonomy restriction (vs. support) from power (i.e., of having influence and control over other groups): We

[14] The significant findings reported in this manuscript were maintained across all studies without including any of these covariates in our analyses.

thus independently manipulated these two factors in Studies 3 and 4. Moreover, we sought to differentiate collective autonomy restriction from general perceptions of unjust actions from the outgroup (Jost et al., 2017; Van Zomeren et al., 2008). Thus, in Study 4 we independently manipulated collective autonomy restrictions (vs. support) and being treated unequally (vs. equally) on a work distribution task by the high-power group.

Study 1

In a culturally diverse sample, we tested our hypothesis that group members would report a greater desire for group power and more support for challenging their social system to the extent that they felt their group lacked collective autonomy. To increase the generalizability of our results, we tested this hypothesis with respect to group members' perceived collective autonomy and desire for group power pertaining to a specific and relevant intergroup context, as well as their global perceptions of collective autonomy, desire for power, and system justification within society more broadly. In doing so, we controlled for group identification, social dominance orientation and perceived discrimination, predicting that as a distinct construct, collective autonomy would relate to desire for power and system justification beyond these other factors.

Method

Participants. Five hundred and fifty-seven participants were recruited from CrowdFlower, a widely used crowd sourcing platform (de Winter, Kyriakidis, Dodou, & Happee, 2015; Vakharia & Lease, 2013). One hundred and eighty seven participants were excluded for: failing to pass at least one of four attention checks embedded in the survey

(*n*=128); having completed the survey for a second time[15] (*n*=19), not naming a racial, ethnic, national, or religious group as their core cultural identity (*n*=35), and/or for not consenting to have their data included in the final analyses (*n*=65). Our final sample thus consisted of 370 participants (233 males, 136 females, 1 not specified, M_{age}=34.85, *SD*=11.83). 38% of the final sample lived in India, 33% resided in the United States, 19% lived in the United Kingdom and the remaining 10 % lived in other countries. Across the sample, participants named 90 different cultural groups as their core cultural identity (e.g., Indian, African-American, White, and Tamil). Participants were compensated $1.25 for participating.

Materials and Procedure.

Identification of core cultural group and relevant outgroup. Participants first identified their core cultural group, which was described to them as "the group you refer to naturally when people ask you what your background is, and you reply "I am x" […]. The core cultural group that defines who I am most". Participants then identified a specific intergroup context and outgroup that they felt was most relevant to their ingroup. To make the ingroup and outgroup salient to participants, we asked participants to type the name of their cultural ingroup in a box labeled "Who we are" and the name of the outgroup in an adjacent box labeled "Who they are" (see Supplementary Materials).

Perceptions of collective autonomy and desire for power within a specific and relevant intergroup context. We first assessed perceptions of collective autonomy and desire for group power with respect to a specific intergroup context and the outgroup that participants felt was most relevant to their core cultural group.

[15]We included participants responses from the first time they accessed the survey, as this response was still naïve and valid.

Collective autonomy restrictions imposed by the outgroup. Restriction of the ingroup's collective autonomy by the outgroup was assessed with one item: *"*We want to know the extent to which the other group has tried to control your group? Do they try to unduly influence your group's culture - your customs, practices, values and traditions? Do they try to prevent members in your group from practicing your culture?" Participants rated their response with a slider scale, ranging from 0 (not at all) to 100 (very much so)**.**

Desire to increase power relative to the outgroup. Perceptions of the present relative power differential between the ingroup and the relevant outgroup was assessed using a slider-scale ranging from - 50 (the other group has the highest power) to + 50 (Our group has the highest power). The scale midpoint (0) was labeled "equal power". Then, using a similar slider scale from - 50 (the other group should have higher power) to + 50 (our group should have higher power), participants indicated the *ideal* power difference that they desired between the ingroup and the relevant outgroup. To compute a score of participants' *desire for power* relative to the outgroup, we subtracted participants' *actual* perceived power score from their *ideal* power score (i.e., larger scores indicated a higher desire for power).

Global perceptions of collective autonomy, desire for power and system justification. We next assessed group members' global perception of having collective autonomy as a group within society and their global desire to feel more powerful as a group in that society. We also measured group members' level of system justification. Agreement with all scale items was rated on a scale of 1 (strongly disagree) to 7 (strongly agree).

Collective autonomy. General perception of collective autonomy was assessed using a 16-item scale of collective autonomy (Kachanoff et al., under review, α=.94; see Supplementary Materials for the complete scale). Sample items included: "We have been free to determine our

customs and practices"; "In general, other groups try to control the extent to which we can act in accordance with our cultural identity" (reverse coded); "In general, other groups support the right that we have to follow our customs and practices".

Psychological desire for group power. Group members' psychological desire to feel more powerful as a group was assessed using four items adapted from Shnabel and Nadler (2008): "My core cultural group would like to have a greater level of control over the interactions between ourselves and other groups", "My core cultural group would like to have more power as a group", "My core cultural group would like to have more influence as a group", and "My core cultural group would like to have more say during our interactions with other groups"(α=.90).

System justification. The extent to which participants justified their social system was assessed with four items from Kay and Jost (2003): "In general, I find society to be fair", "Most policies serve the greater good", "Everyone has a fair shot at wealth and happiness", and, "Society is set up so that people usually get what they deserve" (α=.85).

Control variables. We controlled for three factors previously associated with desire for power or the tendency to legitimize the present social hierarchy: social dominance orientation, group identification and perceived discrimination. Agreement with all scale items was rated on a scale of 1 (strongly disagree) to 7 (strongly agree).

Perceived discrimination. The extent to which participants felt that their core cultural group was discriminated against by other groups was assessed with three items: "My core cultural group has been the target of prejudice", "It is common that members from other groups discriminate against members of my group", and "It is rare that members of my core cultural group face discrimination" (reverse coded) (α=.69).

Social dominance orientation. Participants' social dominance orientation was assessed with 8 items from Ho and colleagues (2015). Sample items include: "An ideal society requires some groups to be on top and others to be on the bottom", and "Group equality should not be our primary goal" (α=.81).

Group identification. Group identification was assessed with a 4-item scale adapted from Doosje, Ellemers and Spears (1995). Items included: "I identify with members of my core cultural group"; "I see myself as being a member of my core cultural group"; "I feel strong ties to other members of my core cultural group"; "I am pleased to be a member of my core cultural group" (α=.89).

Results

Descriptive statistics and variable inter-correlations are presented in Table 8.

Context-specific outcomes.

Desire for power. Providing support for our hypothesis, we found that the more group members felt that a relevant outgroup restricted the collective autonomy of their ingroup, the more they felt a desire to increase their ingroup's power position relative to the outgroup, $r(370) = .32$, $p < .001$. We used hierarchal linear regression to test the distinct relation between restrictions to collective autonomy and desire for power within a specific context, beyond other potentially overlapping variables. Perceptions of discrimination, group identification, and social dominance orientation were entered into the first step of the model, with restrictions to collective autonomy entered into the second step of the model. Perceiving restrictions to the collective autonomy of one's cultural group related to desire for power beyond these other potentially overlapping factors, β=.29, *B*=.23, *SE*=.04, 95% CI [.29, .28] , $p < .001$, $R^2_{change}=.08$ (See Table 9 for complete results).

	M	*SD*	1	2	3	4	5	6	7	8
1. Restrictions to Collective Autonomy by Relevant Outgroup	31.88	31.50		.32***	-.45***	.21***	-.11*	.23***	.05	.10
2. Desire for Power Relative to Relevant Outgroup	5.01	24.67			-.21***	.15**	-.15**	.18***	-.03	.04
3. Collective Autonomy (General)	4.65	1.21				-.28***	.35***	-.52***	.16**	-.18***
4. Desire for Power (General)	5.39	1.18					-.04	.25***	.26***	-.03
5. System Justification	4.41	1.43						-.23***	.20***	.17***
6. Discrimination	4.17	1.38							-.08	.06
7. Group Identification	6.07	1.01								-.20***
8. Social Dominance Orientation	3.01	1.11								

*Note: *p<.05 , **p<.01, ***p<.001.* We utilized pair-wise deletion, therefore sample sizes may vary by correlation.

Table 8. Intercorrelations between collective autonomy restrictions, desire for group power, system justification, discrimination, group identification, and social dominance orientation (Study 1, Manuscript 2)

		Desire Power *Specific*		Desire Power *General*		System Justifi-cation	
		β	*95% CI*	*β*	*95% CI*	*β*	95% CI
Step 1.							
	Discrimination	.18***	1.38, 5.02	.27***	.15, .31	-.22***	-.33, -.13
	SDO	.02	-1.80, 2.79	.01	-.10, .11	.23***	.17, .42
	Group ID	-.01	-2.89, 2.21	.29***	.23, .46	.23***	.19, .47
Step 2.							
	Discrimination	.11*	.19, 3.78	.14*	.02, .21	-.05	-.16, .06
	SDO	-.01	-2.40, 2.03	-.03	-.13, .08	.28	.23, .47
	Group ID	-.04	-3.37, 1.53	.31***	.26, .48	.20	.15, .42
	Restrictions to Collective Autonomy (Context Specific)	.29***	.15, .31	-	-	-	-
	Collective Autonomy (General)	-	-	-.26***	-.36, -.14	.35***	.28, .54

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

Table 9. *Summary of the regression coefficients (standardized beta-coefficients and 95% confidence intervals) in relation to desire for power (general and context specific), and system justification (Study 1, Manuscript 2)*

Global outcomes.

Desire for power. Consistent with our findings with respect to group members' perception of a specific intergroup context, we found that the more group members felt a global sense of having collective autonomy, the less they desired power as a group, $r(369) = -.28$ $p<.001$. Again, we used hierarchal linear regression to test whether global perceptions of collective autonomy (entered second into the model) related to group members' desire to feel more powerful as a group beyond group identification, SDO, and discrimination (entered first into the model). As hypothesized, perceptions of collective autonomy were negatively related to desire for power other potentially overlapping factors, β=-.26, *B*=-.25, *SE*=.05, 95% CI[-.36, -.14], $p<.001$, $R^2_{change}=.05$ (See Table 9).

System justification. As hypothesized, group members who felt a global sense of collective autonomy were more likely to perceive their social system as just and fair, $r(370)=.35$, $p<.001$. Hierarchal linear regression revealed that collective autonomy (entered second into the model) related to system justification beyond group identification, SDO, and perceived discrimination (entered first into the model)[16], β=.35, *B*=.41, *SE*=.07, 95% CI=[.28, .53], $p<.001$, $R^2_{change}=.08$ (See Table 9).

Discussion

Study 1 provides initial correlational evidence that experiencing a restricted sense of a collective autonomy may fuel group members' desire to pursue more power for their group. We

[16] We observed the same pattern of results when utilizing group members' perception of collective autonomy within a specific intergroup context as a predictor of system justification (rather than their general perceptions of collective autonomy). However, when both general perceptions of collective autonomy, and context-specific perceptions of collective autonomy were entered into the regression, only general perceptions of collective autonomy predicted system justification.

found this pattern of results both when examining collective autonomy and desire for group power with respect to a specific intergroup context, and in society in general. Moreover, a general sense of lacking collective autonomy was associated with lower system justification among group members. Importantly, these associations held controlling for other relevant factors, including perceptions of discrimination against the ingroup, group identification and SDO. Thus, collective autonomy appears to uniquely relate to group members' desire for more power and their willingness to justify their social system.

An important strength of Study 1 was our focus on an "open-ended" core cultural group and intergroup context that participants themselves identified as most personally relevant and important. However, this aspect of Study 1 also has its limitations: We could not ensure that participants identified with a historically disadvantaged social group lacking in power. We addressed this in Study 2.

Study 2

Study 2 examined the impact of experiencing restrictions to collective autonomy among Black Americans, a historically disadvantaged low-power group. Specifically, we examined how Black Americans' perception that their collective autonomy has been restricted related to their support for challenging their group's low-power position via collective action. As in Study 1, we also examined how perceived restrictions to collective autonomy related to system justification.

We again controlled for group identification and SDO. Here, we further controlled for ingroup bias and sociostructural factors (perceived stability, legitimacy, and permeability of the social system) previously found to predict low-power group members' willingness to challenge versus accept their group's disadvantaged position in society (Mummendey et al., 1999; Tajfel & Turner, 1979; Wright et al., 1990).

Method

Participants. We recruited 412 self-identified African Americans using Instantly's (formerly uSamp) online panel services to participate in a study exploring people's social attitudes. One hundred and one participants failed at least one of three attention checks embedded in the survey and were excluded from our analyses. Our final sample thus consisted of 311 participants (70 males, 239 females, 2 not specified, M_{age}=40.28, *SD*=16.26). Participants responded to an omnibus survey of their sociopolitical attitudes (see Supplemental Materials for full survey)[17]. We focus our attention here on variables central to our research question.

Materials and Procedure.

Restrictions to collective autonomy. Participants were asked to rate their agreement with eight statements adapted from Study 1, pertaining to "the extent to which Black Americans have been free to determine and practice their own identity and culture": "Other groups have tried to control us", "Other groups have tried to control what we can do", "Other groups have tried to control what we should value and believe", "Other groups have tried to control what customs and practices we should follow", "In general, other groups try to control the extent to which we can act in accordance with our identity", "In general, other groups try to control the extent to which we can follow our customs and practices", and "In general, other groups try to control the extent to which we can act in accord with our cultural values" and "Other groups impose aspects of their culture onto our culture". Participants rated their response from 1 (strongly disagree) to 7 (strongly agree) (α=.94).

[17] Participants reported their perceived present social standing, their ideal social standing using a visual ladder to represent social status and power. Because this measure tapped into perceptions of status as well as power we do not focus on it in our main analyses. Results using this measure are reported in Supplemental Analysis 12.

Outcomes variables.

Support for collective action. We assessed support for collective action with four items: "In order for Black Americans to achieve political gains, they need to close ranks and redouble their efforts", "Black Americans need to stick together in order to fight against their place in the present social hierarchy", "Black Americans should work together to ensure progress towards changing their place in the present social hierarchy" and "There's no point in trying to bring all Black Americans together to fight against their place in the present social hierarchy"(reverse scored) (α=.70). Participants rated their agreement to each item from 1 (strongly disagree) to 7 (strongly agree)**.**

As an additional outcome of whether Black Americans supported collective action as a means of improving their group's power position, we adapted a picture used by the Black Panther party during the Black Power movement to promote collective action for Black Power. Participants were shown a poster containing an image of a black panther, with the caption "Move on over, or we'll move on over you" (see supplementary materials). Participants rated their level of agreement of the message being conveyed in the picture using a slider from "0" (not at all) to "100" (very much so).

System justification. System justification was assessed with Kay and Jost's (2003) eight-item scale (α=.79). Participants rated their response from 1 (strongly disagree) to 7 (strongly agree).

Control variables.

System stability. We assessed Black Americans' perceived stability of the social system using two items[18] taken from Mummendey and colleagues (1999): "The current power dynamic between Black Americans and White Americans in the United States is just temporary (reverse coded) "; "The current power dynamic between Black Americans and White Americans in the United States will not change easily " (r = .14, p=.01). Participants rated their agreement with each item from 1 (strongly disagree) to 7 (strongly agree).

System illegitimacy. We assessed Black Americans' perceived legitimacy of the social system with two[19] items from Mummendey and colleagues (1999): "I think the current balance of power between White Americans and Blacks Americans in the U.S. is unfair" and "The fact that White Americans in the U.S. are currently doing better than Black Americans is unjust." (r=.51, p < .001).

System permeability. We assessed Black Americans' perceived permeability of the social system with two[20] items from Mummendey and colleagues (1999): "If a Black American just worked hard enough, it would be easy for them to be fully accepted by Whites" and "In America, it is not hard to climb up the social hierarchy if you put your mind to it" (r=.47, p < .001). Participants rated their agreement to each item from 1 (strongly disagree) to 7 (strongly agree).

Group identification. We measured group identification using four items. Participants rated two items: "How strongly do you identify with your ethnic group", and "How important is

[18] Because of the relatively weak correlation between the two remaining items we repeated our analyses using both items as separate variables. The significance of our results did not change (See Supplemental Analysis 13).
[19] The scale also included a third item: "White Americans deserve to be better off than Black Americans in the U.S. today." However, we dropped this item because of poor reliability when including it with the other two items (α =.51). The inter-item reliability increased to α=.67 when dropping this item.
[20] The scale also included a third item: "For a Black American, it is nearly impossible to be regarded in the same way as a White American". However, we dropped this item because of poor reliability when including it with the other two items (α =.59). The inter-item reliability increased to α=.64 when dropping this item.

your ethnicity to your identity" from 1 (not at all) to 7 (very much so). Participants then rated their agreement to two items: "I feel a strong bond with other members of my ethnic group", and "I feel solidarity with other members of my ethnic group" from 1 (strongly disagree) to 7 (strongly agree) (α=.86).

Social dominance orientation. SDO was again assessed using the SDO scale (Ho et al., 2015), here using the full 16-item scale. Participants rated their agreement to each item from 1 (strongly disagree) to 7 (strongly agree) (α=.85).

Ingroup bias. We assessed group members' general bias towards their ingroup (Black Americans) relative to White Americans using feeling thermometer ratings. Participants rated how cold or warm they felt towards each of Black and White Americans using a slider-scale ranging from + 0 (coldest feelings) to 100 (warmest feelings) (the scale midpoint was labeled "neutral"). Ingroup bias was computed by subtracting ratings of White Americans (outgroup) from ratings of Black Americans (ingroup) so that higher scores reflected greater bias favoring the ingroup.

Results

Descriptive statistics and variable inter-correlations are presented in Table 10.

We conducted a series of hierarchal linear regressions testing the unique effect of restrictions to collective autonomy on collective action support and system justification controlling for other potentially overlapping variables. For all analyses, group identification, SDO, ingroup bias, system stability, system permeability and system illegitimacy were entered into the first step of the regression model. Collective autonomy was entered into the second step of the regression model. See Table 11 for the complete regression table.

	M	*SD*	1	2	3	4	5	6	7	8	9	10
1. Restrictions to Collective Autonomy	5.23	1.30	1	.41***	.29***	-.24***	.31***	.10	-.14	.23***	-.17**	.24***
2. Collective Action Support	5.66	1.06		1	.16**	-.24***	.45***	.16**	-.12*	.28***	-.39***	.27***
3. Black Panthers Support	42.52	34.58			1	-.09	.13*	-0.11	-.02	.16**	.10	.30***
4. System Justification	3.26	1.11				1	-.26***	-.27***	.50***	.10	.38***	-.30***
5. System Illegitimacy	5.63	1.36					1	.15**	-.26***	.09	-.33***	.22***
6. System Stability	5.01	1.29						1	-.28***	.03	-.25***	.17**
7. System Permeability	3.25	1.68							1	-.00	.34***	-.27***
8. Group Identification	5.51	1.25								1	-0.04	.28***
9. Social Dominance Orientation	2.15	0.93									1	-.13*
10. Ingroup Bias	1.62	2.36										1

*Note: *p<.05 , **p<.01, ***p<.001.* We utilized pair-wise deletion, therefore sample sizes may vary by correlation.

Table 10. Intercorrelations between collective autonomy restrictions, collective action support, Black Panthers support, system illegtimacy, system stability, system permeability, group identification, and social dominance orientation (Study 2, Manuscript 2)

Collective action support. Supporting our hypothesis, the more Black Americans felt that their collective autonomy was restricted, the more they supported collective action as a means of improving their group's power status in America, r=.41, p <.001. Importantly, this association held when the other potentially overlapping variables were accounted for in the model, β=.23, B=.19, SE=.04, 95% CI=[.10, .27], p=.001, R^2_{change}=.05.

Black Americans who felt that their collective autonomy was restricted to a greater extent were also more supportive of a Black Panther propaganda poster from the Black Power movement, r =.29, p<.001, and our regression results confirmed that this relationship remained robust when accounting for the other potentially overlapping variables in the model, β=.24, B=6.34, SE=1.56, 95% CI=[3.27, 9.41], p=.001, R^2_{change}=.05.

System justification. Consistent with the findings of Study 1, Black Americans who felt that their group's collective autonomy was being restricted were less likely to justify their social system, r=-.24, p<.001. Again, hierarchal linear regression confirmed that restrictions to collective autonomy related negatively to system justification when the other potentially overlapping variables were accounted for in the model, β=-.14, B=-.12, SE=.04, 95% CI=[-.20, -.04], p=.005, R^2_{change}=.02.

		Col.Act Support		Black Panther Support		System Justification	
		β	*95% CI*	*β*	*95% CI*	*β*	95% CI
Step 1.							
	System Illegitimacy	.32***	.17, .33	.13*	.30, 6.30	-.09	-.15, .01
	System Stability	.04	-.05, .11	-.15*	-7.11, -.87	-.09	-.16, .01
	System Permeability	.09	-.01, .12	.00	-2.55,2.44	.34***	.16, .30
	Group Identification	.20***	-.44, -.20	.07	-1.37, 5.09	.17***	.07, .24
	SDO	-.28***	.01, .10	.16*	1.28, 10.25	.19***	.10, .35
	Ingroup Bias	.13*	2.13, 3.86	.30***	2.59, 6.03	-.19***	-.14, -.04
Step 2.							
	System Illegitimacy	.27***	.13, .29	.07	-1.33, 4.72	-.05	-.13, .04
	System Stability	.03	.05, .11	-.15**	-7.13, -1.07	-.08	-.16, .01
	System Permeability	.10	-.00, .13	-.01	-2.57, 2.28	.34***	.16, .29
	Group Identification	.16***	.06, .22	.03	-2.27, 4.08	.19***	.09, .26
	SDO	-.27***	-.42, -.19	.17**	1.94, 10.69	.18***	.09, .34
	Ingroup Bias	.10	0, .09	.27***	2.12, 5.50	-.18***	-.13, -.04
	Restrictions to Col Aut	.23***	.11, .27	.24***	3.27, 9.41	-.14**	-.20, -.04

Table 11. Regression coefficients (standardized beta-coefficients and 95% confidence intervals) in relation to collective action, Black Panthers support, and system justification (Study 2, Manuscript 2)

Discussion

Building on Study 1, Study 2 provides further (correlational) support for our hypothesis that experiencing restrictions to collective autonomy is a unique mobilizing agent for promoting low-power group members to challenge their social system and engage in collective action. As predicted, Black Americans tended to be more supportive of collective action when they felt that their group lacked rather than maintained collective autonomy in society. Replicating Study 1, we again found that low-power group members who reported feeling greater collective autonomy were more likely to justify the very social system that otherwise disadvantages their group. Furthermore, restrictions to collective autonomy related to collective action support and system justification when controlling for several potentially overlapping factors (group identification, social dominance orientation, and ingroup bias), and structural factors (perceived stability, legitimacy, and permeability of the social system).

Study 3

In Study 3 we sought to experimentally test the link between collective autonomy and group members' desire to pursue power for their group. We created an engaging laboratory context in which group members experienced either having or lacking collective autonomy as a group. Groups created a novel and meaningful cultural identity for their group. Group members could then actually act in accordance with that cultural identity by playing an interactive and engaging cooperative video game in which each group member controlled an in-game avatar that was representative of the group's newly formed cultural identity. We manipulated whether group members had their cultural identity forcefully changed by a high-power outgroup (i.e., restrictions to collective autonomy) or whether group members were permitted to practice their culture by the high-power outgroup (i.e., collective autonomy support). These two conditions

were compared to a control condition in which the outgroup had influence over an aspect of the study that was unrelated to the cultural identity of the ingroup. In all conditions, groups lacked influence; however, only in the collective autonomy restriction condition did groups lack collective autonomy. We hypothesized that relative to the other two conditions (in which groups lacked influence but maintained their collective autonomy), low-power group members who had their collective autonomy restricted would report a greater desire for group power. We did not expect any differences between group members in the collective autonomy support condition and group members in the control condition, because in both cases, low-power group members maintained their collective autonomy.

Methods

Sample.

We recruited 415 participants from the McGill University community (i.e., through a paid participant pool, an extra-credit psychology participant pool, McGill classified ads and posters) over a two-year period[21]. Twelve participants were unable to complete the experiment due to not enough participants attending the session, or because of a computer error. Thus, we obtained our target sample of 400 participants (and 30 groups per condition), which conforms to guidelines for conducting multilevel and group level analyses (Maas & Hox, 2005; Scherbaum &

[21] Data collection occurred over a two-year period 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 beyond the scope of the present research (See Supplemental Materials). Furthermore, 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 project of an undergraduate research student. These conditions were not part of the original experimental design, and were designed to answer a question specific to the undergraduate research student. We therefore did not analyze these additional conditions in the present research. During the first year of testing the study description was delivered verbally to participants, and participants then read a written description of the experiment explaining the coat of arms and group quest video game (See appendix for verbal description, and written description provided to participants). During the second year of testing we created a video recording of the verbal/written instructions to reduce potential experimenter variance. Our results were consistent across all outcomes for both sub-years. Moreover, our results when utilizing the total sample did not change when controlling for the year in which the study was run (Supplemental Analyses 14).

Ferreter, 2009). Participants were compensated with twenty dollars for engaging in the two-hour experiment or with two extra credits in their psychology course. Nine participants were excluded because they had missing data for key outcomes of perceived collective autonomy and/or desire for power. A total of 394 participants (97 groups) were included in our analyses (collective autonomy restriction condition, N= 135, 32 groups; collective autonomy support condition, N= 124, 31 groups; control condition, N=135, 34 groups; 292 Female, 96 Male; 6 not specified M_{age}=20.69, SD=3.39).

Procedure and materials.

Group formation. Groups of six to ten participants were greeted by two experimenters, and were told that the purpose of the experiment was to investigate intragroup dynamics and team performance when playing a co-operative video game designed for up to five people. Participants were randomly divided into two groups (n=3-5)[22] by drawing slips labeled J and K. Following group assignment, participants were led by one of the experimenters into a separate testing room in which their group completed the rest of the experiment (there was no direct contact between groups following group assignment). Regardless of whether participants were assigned to group J or K, they learned that their ingroup was disempowered compared to the other group. Furthermore, all subgroups within a given experimental session were randomly assigned to receive the same manipulation (this was done for logistical purposes to make the experiment easier to run). The purpose of having participants see members of the other group at the beginning of the experiment was to make the intergroup context of the experiment salient, and to enhance believability of the cover story (i.e., that there was another real outgroup involved

[22] We repeated all of the analyses for Study 3 controlling for group size; results are consistent with those reported in the main text (See Supplemental Analyses 15).

in the experiment with power over the ingroup). Once each group was in their separate room, we described the details of the experimental procedure to the participants.

Identity formation. A core feature of the present experiment was giving groups the opportunity to create a meaningful cultural identity that they would be invested in preserving and practicing. To form this identity groups created a *coat of arms*— a shield decorated with different colors, objects and animals (called charges) that visually represent the various shared traits and values of the group (Fox-Davies, 1909). Such symbols of group identity have been found to be important aspects of a group's identity and promote a cohesive and shared sense of identity among group members (Callahan & Ledgerwood, 2016). Groups formed their coat of arms using an interactive "coat of arms generator" that we developed for the purpose of the experiment. Using the coat of arms generator, participants chose a color for their shield (e.g. gold, silver, blue), a charge (e.g. boar, tiger, stag), and a color for their charge. For each option, the program provided a short description of the values and traits symbolized by that item. For instance, a Stag was described as symbolizing that "*group members are able to grow and improve themselves even in the face of adversity. They are constantly growing as individuals, and are able to recuperate when they struggle".* Participants were also able to create a name for their group, as well as a group motto (See Figure 5 for a snapshot of the coat of arms generator taken from Kachanoff et al., under review).

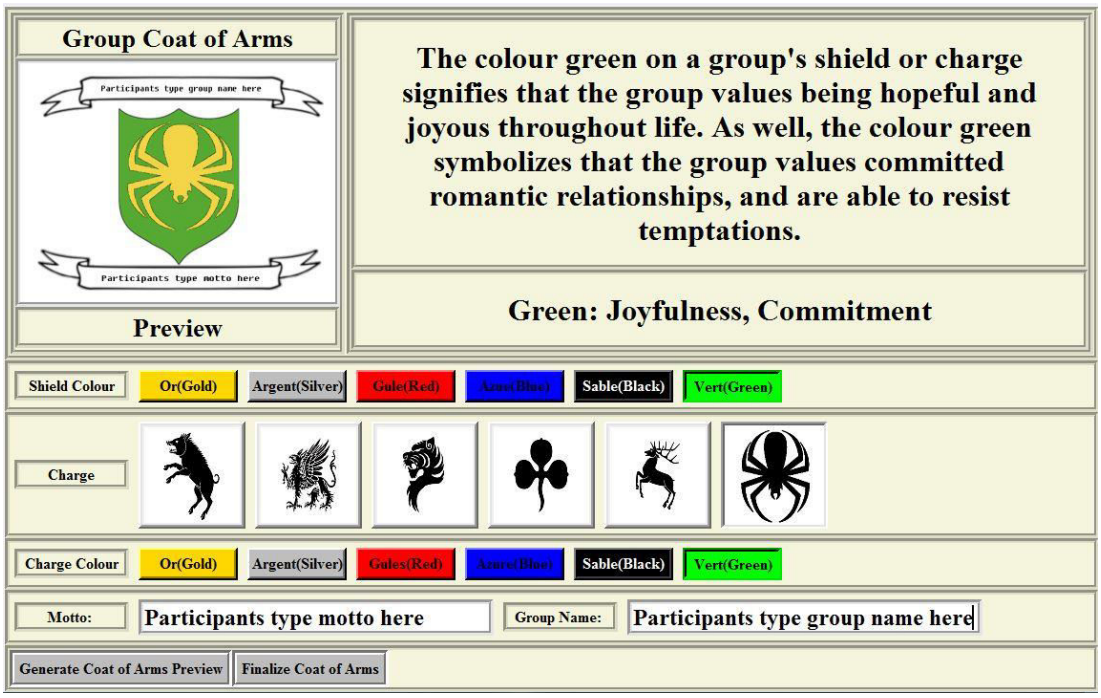

Figure 5. *User interface of the coat of arms generator that group members used to form a novel and meaningful identity for their group in Manuscript 1 (Study 2) and Manuscript 2 (Study 3). Note: Groups selected: (1) a color for the background of their shield, (2) a charge for their coat of arms, (3) the color of their shield, (4) a motto for their group, and (5) a name for their group.*

Identity-concordant behavior (Group Quest). The second core feature of the present experiment was that group members could actually behave in accord with their social identity. To this end, we created a video game in which ingroup members controlled identical in-game avatars which were a direct reflection of their coat of arms. Specifically, following the creation of their coat of arms, participants played the interactive group videogame, Group Quest. Group Quest was programmed for the purpose of the experiment using the War Craft 3 world map editor (Blizzard Entertainment, 2002). When they created their coat of arms, it was explained to participants that the colors and symbols that they chose for their coat of arms would have a direct impact on the abilities and characteristics of an in-game avatar that each group member would control when playing an interactive multiplayer video game later on in the experiment.

Importantly, however, participants were told that: "While all combinations of charges and colors will provide a different experience in the game, the overall advantage of any combination is the same!" This ensured that, in the case that participants had their coat of arms changed by the outgroup, participants' potential dissatisfaction with their avatar would be a reflection of the avatar not representing their chosen identity and culture, rather than their concern over the overall power associated with the avatar or its effectiveness in Group Quest. Participants each played the game at separate computers that were connected using a LAN network such that participants' characters interacted in the same virtual in-game world. Participants were able to communicate verbally with their teammates throughout game play, as their computers were located in the same room. The game involved completing different quests, in which team members cooperated to solve puzzles and combat enemies generated by the computer. Participants were given 21 minutes to complete as many quests as possible. It was made clear to participants that they were not competing with members of the outgroup in the other room; rather, they played against computer-controlled units in the game.

Experimental manipulation. Prior to participants forming their coat of arms we delivered the experimental manipulation. During the first year of testing we verbally told participants that we had randomized which group would be able to determine the other group's coat of arms/choose which room in which to conduct the study, prior to the experiment taking place. During the second year of testing the experimental manipulation was contained in the introductory video.

In the *collective autonomy restriction* condition participants were told, prior to creating their coat of arms, that the outgroup would have the responsibility and power to look over, evaluate and potentially alter their ingroup's coat of arms (See Supplementary Materials for

detailed 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. The experimenter then reentered the room with a modified coat of arms and explained to participants that the outgroup had chosen to alter their coat of arms. The coat of arms was systematically altered by changing the charge, the shield color and the color of the charge[23]. Specifically, participants were told:

> "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."

In the *collective autonomy support* condition ingroup members were again told that the outgroup would have the responsibility and power to look over, evaluate and change their coat of arms. However, in this condition the experimenter returned with an un-altered version of the ingroup's coat of arms. Specifically, participants were told:

"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 the *control* condition, participants were told that the outgroup could choose whether to make the ingroup change the room in which they would play the multiplayer video game prior to creating their coat of arms (see Supplemental Materials for script)[24]. Participants were always informed that, after a hard discussion mulling over the decision, the outgroup had decided to stay in their own room. In all three conditions we told groups that the outgroup had a

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[23] 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.

[24] During the first year of testing 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 testing we gave this feedback to participants *after* they had created their coat of arms so that the timing of this feedback was consistent with when the feedback was given to participants in the collective autonomy restriction/support conditions.

"hard time" in deciding the fate of the ingroup, in order to re-emphasize that the outgroup had influence over their ingroup and used this power to deliberate over the fate of the ingroup.

After group members received feedback from the outgroup as to whether they could keep their coat of arms, they played Group Quest. As the game loaded, it prompted participants to indicate the shield color, charge type, and charge color of their coat of arms. As group members indicated each component of their coat of arms, a message appeared describing the special skill the component would give participants' in-game avatar. For example, participants who had selected a "boar" as their charge saw the message: "You have selected the strong and courageous Boar! Out of all the units, the boar's melee attacks are the strongest". To further link the in-game avatar to group members' coat of arms, the appearance of the in-game avatar reflected the group's coat of arms (See Figure 6 for a snap shot of game play from Group Quest, taken from Kachanoff et al., under review). Although group members in the collective autonomy support condition and in the control condition were able to enter the original characteristics of their coat of arms during the loading phase, group members in the collective autonomy restriction condition had to enter in the characteristics of the altered coat of arms. Thus, group members in the collective autonomy restriction condition were not able to play with the avatar that reflected their original coat of arms. Rather they had to control an avatar based on the attributes ostensibly imposed by the high-power outgroup.

Figure 4. Game play snap-shot of the interactive video game, Group Quest used in Manuscript 1 (Study 2) and Manuscript 2 (Study 3). 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.

Measured variables. Once participants completed playing Group Quest they individually completed a survey including measures of collective autonomy, desire for group power, and collective action towards the outgroup. Agreement with all survey items was rated using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Collective autonomy. Perceptions of collective autonomy were assessed using an 11-item scale adapted from Kachanoff and colleagues (under review). We included these items as a manipulation check to ensure that group members in the collective autonomy restriction condition, experienced lower collective autonomy relative to the other two conditions. Sample

items included: “We were free to determine our own group identity”, “The other group told our group what we could and could not do” (reverse coded), “We felt pressured by the other group” (reverse coded) (α=.92; See Supplemental Materials for all scale items).

Desire for group power. Participants' desire for group power was measured using four items adapted from Shnabel and Nadler (2008). Items included: “During this study, our group would have liked to have had a greater level of control over the interactions between ourselves and the other group”, “During this study, our group would have liked to have had more power as a group”, “During this study we would have liked to have had more say during our interactions with the other group”, “During this study we would have liked to have had more influence as a group” (α=.81).

Control variables. In order to dissociate the effect of the collective autonomy manipulation from general threats to agency or identification, we assessed how strong participants felt as a group during the experiment, as well as how identified group members felt during the experiment. Feeling strong as a group was assessed with the item “During the study we felt relatively strong as a group”. Group identification was assessed with 9 items adapted from Cameron’s (2004) tripartite scale of group identification. Sample items included: “I felt good thinking about myself as a member of my group”, “I felt strong ties to the other members of my group” and “During the study, being a member of my group was an important part of my self-image” (α=.73). There were no differences between conditions in terms of group members’ reported feelings of group strength and group members’ level of identification. Furthermore, the results of our primary analyses did not change when including these two variables as covariates (See Supplemental Analysis 16).

Results

Means, standard deviations and correlations for all measured variables are summarized in Table 12.

	M	*SD*	1	2	4	5
1. Collective Autonomy	5.76	1.27	1	.34***	-.09	.14**
2. Desire for Power	4.41	1.30		1	.21***	.09
3. Group Strength	5.19	1.44			1	.27***
4. Group Identification	5.02	0.86				1

*Note: **p<.01, ***p<.001.* Pair-wise deletion was used, thus sample sizes may differ for each correlation.

Table 12. Intercorrelations between collective autonomy, desire for power, group strength and group identification, across experimental conditions of Study 3, Manuscript 2

We could not assume the independence of responses of participants who were nested within the same group. Therefore, we used multilevel linear modeling (Finch, Bolin, & Kelley, 2014; Hayes, 2006; Raudenbush & Bryk, 2002) conducted with R (Finch et al., 2014) and the lme4 package (Bates et al., 2016) to analyze the data. Specifically, we assessed the fixed effect of condition on participants' perceived collective autonomy and desire for power, while accounting for the random effect of participants' unique group. We used a restricted maximum likelihood (REML) solution, ideal for estimating multilevel models (Kreft & De Leeuw, 1998). Moreover, we used the LmerTest package (Kuznetsova, Brockhoff, & Christensen, 2015) to compute t-statistics using the Satterthwaite approximation recommended for multi-level analyses.

The intraclass correlation coefficients (ICCs) for collective autonomy, ICC=.52, 95%*CI*[.50,54] and desire for group power, ICC=.31, 95%*CI*[.26,.37] were all significant, indicating that group members' perceptions of collective autonomy and desire for group power were moderately to highly interrelated with the perceptions of their fellow group members[25].

Manipulation check.

As expected group members who had their collective autonomy restricted perceived lower collective autonomy than those in the control condition, and those in the collective autonomy support condition (collective autonomy restriction: M=4.46, SD=1.12; control: M=6.47, SD=.71; collective autonomy support: M=6.41, SD=.64; restriction versus control: γ=2.01, 95% *CI* [1.81, 2.21], $t(391)=19.35$, $p<.001$, r=.69 ; restriction versus support: γ=1.95, 95% *CI* [1.75, 2.16], $t(391)=18.42$, $p<.001$, r=.68). Moreover, as expected there were no differences in the perceived collective autonomy of group members who were in the control condition and group members who were in the collective autonomy support condition, γ= -.05, 95% *CI* [-.26, .15], $t(391)=-.52$, p=.61, r=.02.

Desire for group power.

Next, we tested our hypothesis that disempowered groups would have a greater desire for group power primarily in intergroup contexts in which their group lacked (*vs.* enjoyed) collective autonomy (despite lacking influence over other social groups in both cases). Supporting this hypothesis, low-power group members who had their collective autonomy restricted by a high-power outgroup reported a significantly greater desire to increase their

[25] These relatively large ICCs are expected because all members of the same group were exposed to the same collective autonomy manipulation which we hypothesized should impact their perceptions of collective autonomy and in turn, their desire for power and support for collective action. Furthermore, beyond exposure to the same manipulation, the large ICCs observed in the present experiment are also likely due to group members having been able to discuss and share the experience of having collective autonomy (or a lack there of) with their fellow ingroup members for almost two hours within the dynamic context of the experiment.

group's power (M=4.80, SD=1.21) relative to low-power group members who had their collective autonomy supported by the high-power outgroup (M=4.29, SD=1.33), γ=-.53, 95% *CI* [-.91, -.16], t(89.9)=-2.81, p=.006, r=.28. Low-power groups who had their collective autonomy restricted also desired power to a greater extent than low-power group members who were never at risk of losing their collective autonomy at the hands of the high-power group (i.e., those in the control condition; M=4.14, SD=1.28), γ=-.66, 95% *CI* [-1.03,-.30], t(89.9)=-3.59, p=.001, r=.35. Moreover, as predicted, low-power group members who had their collective autonomy supported by the outgroup did not express a greater desire to increase their group's power relative to those in the control condition, γ=.13, 95% *CI* [-.24, .50], t(92.48)=.71, p=.48, r=.07.

Discussion

In support of our hypothesis, Study 3 provides experimental evidence that low-power group members who lack influence in their society will desire power when their collective autonomy is restricted rather than supported. Specifically, we found that low-power ingroup members desired group power to a greater extent when the high-power outgroup did not permit the ingroup to maintain and practice its own culture compared to when high-power outgroup supported their collective autonomy. Moreover, as expected we did not observe any differences between group members who had their collective autonomy supported by the outgroup and group members in the control condition. Thus, consistent with and extending previous research on power and personal autonomy at the individual level (Lammers et al., 2016), the present research indicates that group members may desire group power in order to ensure that their group can maintain its collective autonomy. Importantly, we also find evidence to support our claim that collective autonomy is a construct distinct from other potentially related constructs previously considered with respect to collective action (Van Zomeren et al., 2008). Specifically,

our collective autonomy manipulation did not impact feelings of group strength or group identification.

Study 4

A potential limitation of Study 3 is that it is unclear whether low-power groups who had their collective autonomy restricted rather than supported engaged in collective action to a greater extent because of the restrictions to their collective autonomy *per se.* That is, it is possible that low-power group members who had their collective autonomy restricted felt that they were treated in a negative manner by the high-power outgroup. In contrast low-power group members who had their collective autonomy supported may have felt that the high-power group treated them in a positive manner. Therefore, we cannot rule out the possibility that low-power ingroup members in the collective autonomy restriction condition sought power for their ingroup to a greater extent simply because the outgroup demonstrated that it would be willing to actively abuse its power in order to act negatively towards their ingroup.

To address this limitation, Study 4 sought to demonstrate that restrictions to collective autonomy versus collective autonomy support would uniquely lead group members to challenge their social system and engage in collective action regardless of whether the high-power outgroup treated the low-power group in a positive or negative manner in other domains. Specifically, we examined whether the mobilizing effect of collective autonomy restriction (versus support) would be present both in contexts where the high-power group treated the low-power group unjustly by unevenly burdening the group with unpleasant work, and, in contexts where the high-power group treated the low power group fairly by equally distributing a work task. Empirically showing that collective autonomy restriction has a unique impact on collective action and system justification separate from unequal treatment is critical, given that perceived

injustice stemming from unequal treatment is known to be an important mobilizer of collective action (e.g., Crosby, 1982; Pettigrew et al., 2008; Runciman, 1966; Van Zomeren et al., 2008; Walker & Smith, 2002) and system justification (Jost et al., 2017).

Like Study 3, Study 4 utilized an engaging interactive laboratory experiment, this time involving three (rather than 2) groups of three to four people. Groups imagined that they were a low-power group (the Hoye) living on a fictional planet called Grabodia along with two other groups: a high-power group (the Arado) and another low-power group (the Suebla). All three groups in the experiment were lead to believe that they were the Hoye (low-power) and that the other two groups were the Arado (high-power outgroup) and the Suebla (a third-party low-power outgroup that had the same amount of power as the ingroup). As in Study 3, an important aspect of the experiment was to have groups first create a meaningful identity for their group and then be able to actually behave in accordance with this identity. Groups then completed a tedious work task. As two independent factors, we manipulated (1) whether groups were able to practice their newly formed culture during the experiment or whether they had it stripped by the outgroup (i.e., collective autonomy support vs. restriction), and (2) whether groups were treated equally or unequally by the high-power group. We assessed collective action support and system justification both at the individual level and at the group level, including behavioral measures of collective action and system challenge at the group level. We hypothesized that experiencing restrictions to collective autonomy (vs. support) would promote greater collective action and less system justification amongst the low-power group, regardless of whether they were treated equally or unequally by the high-power group.

Method

Participants. We recruited 362 participants (283 female, 58 male, 21 unspecified; M_{age}=20.79; *SD*=2.85*)* from the McGill University community (i.e., the McGill psychology extra-credit pool, the McGill social psychology paid participant pool, and the McGill classified ads) for a two-hour study on intergroup relations. In total 111 groups took part in the experiment. Eight groups were dropped from the experiment because they included only two people. Our final sample consisted of 346 participants nested in 103 groups across four conditions: (1) Collective Autonomy Support + Equal Treatment (87 individuals in 25 groups); (2) Collective Autonomy Support + Unequal Treatment (94 individuals in 28 groups); (3) Collective Autonomy Restriction + Equal Treatment (75 individuals in 26 groups); and (4) Collective Autonomy Restriction + Unequal Treatment (82 individuals in 24 groups).

Procedure and Materials.

Group formation. Similar to Study 3, 9-12 participants arrived at the lab at one time and were randomly divided into three sub groups (n=3-5)[26] by drawing slips labeled A, B, or C. Groups were led to separate testing rooms and had no further direct contact with the other groups. Groups were told that they would be recorded for purposes of the study (a camera was visible in the corner of the room). We recorded groups in order to have access to group members' behavioral and verbal responses during the experiment. Groups watched an introductory video that provided general information about the context of Grabodia. At this time groups were told that they belonged to the Hoye group, and lived on Grabdodia along with the two other groups – the Arado and the Suebla. Groups were told that the high-power Arado group controlled a powerful energy crystal that allowed them to have control over the structure of

[26] We repeated all of the analyses for Study 4 controlling for group size and found that conclusions remained consistent (See Supplemental Analyses 17).

Grabodian society. Because of this, participants were informed that the Arado group would have the responsibility and power to make decisions that would impact all three groups during the experiment.

Identity formation. As in Study 3, we sought to create an engaging laboratory context in which lacking collective autonomy would have meaningful and tangible consequences for group members' behavioral experiences during the study. It was explained to participants in the introductory video that they would engage in three different identity formation tasks in order to form a meaningful group identity. The first task involved the creation of a coat of arms using the same procedure utilized in Study 3. Next, groups determined a *cultural food.* Groups were told that food is an important component of a group's culture and thus they could determine their own cultural food for the purposes of the experiment. Groups were provided with six potential food choices: Chocolate, Chips, Cookies, Seeds, Dried Fruits, or Vegetables. Groups were told that they would be provided with their chosen food during the experiment. Finally, groups selected from among four different behavioral customs that they could enact during the experiment in order to express salutations to their fellow group members and celebrate group accomplishments (e.g., elbow tapping as a greeting; see Supplemental Materials for more details). The different elements of this task were inspired by the idea that the food that group members eat and the behavioral customs which group members enact are rooted in their culture and social identity (Oyserman, 2007; Oyserman, 2009; Oyserman, Fryberg, & Yoder, 2007). Thus, we reasoned that a meaningful restriction of collective autonomy would involve having one's group being prevented from eating its own cultural food and engaging in its behavioral customs.

Work task. Following the group's formation of their cultural identity, groups watched a video explaining that the housing units and factories of Grabodia are powered by light grey

"*mana beads"*. Thus, it was explained to group members that an important objective of the three groups of Grabodians is to mine light grey mana-beads from the quarries of Grabodia. In the context of the experiment, mining for mana beads took the form of a tedious work task in which participants had to sort out several tiny light grey beads (roughly 1 cm in diameter) from a bin containing thousands of multicolored beads. The video also explicitly warned groups not to remove "black mana beads" as these contained unstable dark energy that could be especially dangerous to Grabodians. We included this subtle information in order to see if some groups would, of their own accord, rebel by mixing in these dark "black" mana beads along with the desired light grey mana beads (an open-ended behavioral measure of collective action). To make the work task feel even more tedious, it was explained to groups that once they finished their assigned work for the round, they could relax and socialize with their fellow group members or play video games that were loaded on the lab computers until all the other groups finished their work. Regardless of condition, groups were always told that they had finished their assigned work just when the other two groups had also finished their work, and thus, never actually played the video games. Work was completed over two separate rounds, during which the groups had to sort a certain number of beads on each round.

Experimental manipulations. Before groups commenced the work task they were informed that because the high-power Arado group controlled the power crystal the Arado would be able to make important decisions concerning how the three groups would experience the work task. Specifically, participants were told that the high-power group would have a say over (1) how much work each of the groups would be responsible for doing during each of the rounds (i.e., equal vs. unequal treatment) and, (2) whether each group would be permitted to practice their culture during the work task (i.e., collective autonomy support vs. collective autonomy

restriction). The experimenter ostensibly left with a printout of the ingroup's coat of arms, and a paper indicating the ingroup's chosen food and behavioral custom to show the high-power Arado outgroup. The experimenter explained that she/he would ask the Arado their preference regarding the work distribution for the task, and with respect to what cultural customs/practices should be permissible on Grabodia. The experimenter returned shortly thereafter and delivered both experimental manipulations at the same time.

In the *collective autonomy support condition*, groups were told that the high-power group chose not to change any elements of their culture. Groups were provided with the coat of arms they had originally created, and were told that they could practice the custom they originally selected as they complete the work task. Moreover, group members were provided with the food they had originally selected as their cultural food. In contrast, in the *collective autonomy restriction condition*, groups were told that the Arado had decided to change their coat of arms, change their chosen custom, and to change their chosen food[27]. Specifically, as was done in Study 3, groups were provided with a coat of arms that differed entirely from the coat of arms they initially created; the given coat of arms had a different charge, charge color and shield color. Additionally, in Study 4, the group's name and motto were also left blank to further emphasize to group members that the outgroup completely restricted their cultural identity. Groups were also told that they had to perform a different custom from the one they originally selected as they engaged in the work task. Moreover, groups were given a different food to eat from the one they initially chose as their desired food. For example, if groups selected cookies, they may have been

[27] The new coat of arms, custom, and food which group members were provided was counter-balanced across conditions in which groups had their collective autonomy restricted.

given seeds, dried fruit, or carrots instead[28]. Importantly, ingroups (Hoye) were always told that the high power outgroup (Arado) treated the other low-power group (Suebla) the same way as their ingroup to eliminate the possibility that ingroups felt mistreated relative to the other low-power outgroup.

In the *equal treatment condition,* groups were told for both work rounds there was a total of 180 beads to be sorted, and that the Arado decided to divide the work equally between the Arado, the Hoye and the Suebla with each group sorting 60 beads. In contrast, in the *unequal treatment condition,* during both rounds, the Hoye ingroup was told there were a total of 120 beads to be sorted by all three groups, and that the Arado decided not to work, leaving the participants' ingroup (the Hoye) and the Suebla to sort 60 beads each during each round. Thus, regardless of condition, groups always sorted 60 beads per round, but in one case they (and the Suebla) were treated equally by the Arado and in the other they (and the Suebla) were treated unequally. During the work rounds, groups were told that they could eat their chosen food and practice their culture (that chosen by their own group in the collective autonomy support condition and that chosen by the Arado in the collective autonomy restriction condition).

Self-report measures of collective action and system justification (individual and group level). Once groups completed the second of the two work rounds, each individual participant was given a brief paper questionnaire assessing their personal degree of system justification and support for collective action. System justification was assessed using the same four items used in Study 1 (α=.88). Collective action was assessed using five items (sample items: "Our people

[28] Groups who initially chose a healthy food (carrots, dried fruit, or seeds) were provided with a different healthy food. Groups who initially chose an unhealthy food (cookies, dried fruit, or chocolate) were also provided with a healthy food. We designed the study in this manner, because unhealthy foods tend to be pleasurable/rewarding stimuli, and wanted to reduce the possibility for group members to feel that the outgroup was being kind to their ingroup by providing a rewarding food.

need to stick together and act collectively"; "We need to rise together to ensure that we are not pushed around"; α=.87). After we assessed these outcomes at the individual group member level, participants completed a similar *group* form (i.e., one response per group) asking the identical questions assessing system justification (α=.88) and collective action support (α=.86). Agreement with all survey items was rated using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Behavioral measure of collective action (group level). We coded whether groups would, on their own accord, try to rebel during the work task. We ascertained whether groups rebelled based on the mana-beads that they provided the experimenter after each work round (which were counted by the experimenter out of sight from the groups). Groups rebelled during the work task by (1) mixing in undesirable and dangerous black beads alongside the light gray beads they were tasked with sorting, (2) mixing in beads of colors other than grey or black, by (3) purposefully choosing not to sort any beads, or by (4) purposefully sorting the wrong number of beads. With respect to group members purposefully sorting the wrong number of beads, it is possible that groups accidently provided the experimenter with an insufficient number of beads during the experiment by miscounting. To rule out this possibility, two independent coders watched video recordings[29] of the groups engaging in the experiment and ensured that groups who provided the wrong number of beads actually deliberately planned to do so (based on their verbal statements). By watching the video we were also able to detect some groups who without the experimenter's knowledge, had secretly stolen grey and/or black manna beads during the experiment in order to use them against the high-power group at a later time. We formed a dichotomous variable of

[29] Because of camera malfunctions we did not have access to recordings for 11 groups.

rebellious behavior in which groups who exhibited any of these rebellious behaviors were coded as "1", while groups who did not exhibit any rebellious behavior were coded as "0".

Unprompted verbal expressions of dissatisfaction and system-challenge (group level). Two independent coders watched the video recordings and counted the total number of times that members within each group expressed dissatisfaction with their Grabodian society and/or the way that they were treated by the high-power group while they completed the work task. The types of dissatisfaction and system challenge verbally expressed by participants included (1) complaining about the changes that may have been made to groups' culture (e.g., "we don't have a motto anymore…or a name…no!"); (2) the amount of work that participants' were assigned by the high-power group (e.g., "they are not sorting anything!"); (3) general feelings of being mistreated by the high-power group (e.g., "we are being discriminated against!"); and (4) general dissatisfaction with the work task (e.g., "again? I don't see the point of this [*participant was referring to the second round of sorting*]"). There was a high level of internal consistency between both rater's scoring of the number of verbal complaints exhibited by each group ($ICC_{AbsoluteAgree}$=.98, 95%*CI*[.97, .99], p<.001). Thus, we computed a mean score of both coders' score to use in our analyses.

Manipulation checks. At the very end of the experiment[30], we assessed group members' perceptions of collective autonomy and equal treatment as manipulation checks. Collective autonomy was assessed with two items: "I felt that my people could maintain our cultural customs and practices when the Arado group was in power" and "I felt that my people were prevented from practicing our culture when the Arado group was in power" (r=.68, p <.001). Equal treatment was assessed with two items: "I felt that my people were taken advantage of

[30] After group members completed the work task, and prior to them completing the final questionnaire, they engaged in a second phase of the experiment that examined hypotheses unrelated to those we examine here.

when the Arado were in power" and "I felt that my people were exploited when the Arado were in power" (r=.90, p <.001).

Results

Analysis strategy. As in Study 3, we utilized multilevel modeling to analyze the responses collected from individual group members. To analyze group-level outcomes (i.e., group ratings of system justification, collective action support, and our behavioral outcome of collective action) we used traditional Ordinary Least Squares. Descriptive statistics and correlations for individual-level outcomes can be found in Table 13, while descriptives and correlations for group-level outcomes can be found in Table 14.

	M	*SD*	1	2	3	4
1. Collective Autonomy	4.17	2.36	1	-.33**	-.34**	.38**
2. Perceived Inequality	4.31	2.05		1	.41**	-.51**
3. Collective Action Support	5.30	1.32			1	-.59**
4. System Justification	3.39	1.50				1

*Note: **p<.001.* Pair-wise deletion was used, thus sample sizes may differ for each correlation.

Table 13. Intercorrelations between collective autonomy, perceived inequality, collective action support, and system justification assessed at the individual group member level, across experimental conditions of Study 4, Manuscript 2

	M	*SD*	1	2	3	4
1. Collective Action Support	5.72	1.00	1	-.66**	.38**	.35**
2. System Justification	2.99	1.34		1	-.30**	-.38**
3. Behavioral Engagement in Collective Action (Presence/Absence)	.18	.39			1	.44**
4. Verbal Expression of Dissatisfaction and System Challenge (Number of instances observed per group)	2.02	2.59				1

*Note: **p<.001.* Pair-wise deletion was used, thus sample sizes may differ for each correlation.

Table 14. Intercorrelations between collective action support, system justification, behavioral engagement in collective action, and verbal expression of dissatisfaction and system challenge assessed at the group level, across experimental conditions of Study 4, Manuscript 2

The intraclass correlation coefficients (ICCs) for perceived collective autonomy, ICC=.64, 95%*CI*[.63,.66], perceived exploitation, ICC=.51, 95%*CI*[.49,.53], system justification ICC=.44, 95%*CI*[.41,.47] and collective action, ICC=.36, 95%*CI*[.32,.41] were all large and significant. As in Study 3, the high ICCs are to be expected due to all members of the same group being exposed to the same experimental manipulation, and because group members could discuss their shared experiences with their fellow group members.

Individual group member responses.

Collective autonomy (manipulation check). As expected, the collective autonomy restriction manipulation was effective in reducing group members' perceptions of collective autonomy, γ=-4.02, 95% *CI* [-4.34, -3.70], $t(90.04)= -24.68$, $p<.001$, $r=.93$. Group members who had their collective autonomy restricted ($M=2.09$; $SD=1.28$) reported significantly less collective

autonomy than those who had their collective autonomy supported by the high-power group (*M*=6.10; *SD*=1.22). We also found further evidence that collective autonomy is distinct from perceptions of injustice and unequal treatment. Specifically, collapsing across the collective autonomy restriction/support conditions, being exploited (*M*=4.10; *SD*=2.39) versus being treated equally (*M*=4.25; *SD*=2.34) on the work task did not significantly impact group members' perceptions of collective autonomy, γ=.23, 95%*CI* [-.09, .55], *t*(90.33)= 1.42, *p* =.16, *r*=. 15.

Perceived inequality (manipulation check). Also as expected, we found that collapsing across the collective autonomy restriction/support conditions, group members who were treated unequally during the work task (*M*=5.23; *SD*=1.53) perceived less equal treatment than groups who were treated equally during the work task (*M*=3.06; *SD*=2.00), γ=2.01, 95%*CI* [1.57, 2.47], *t*(89.87)=8.74, *p*<.001, *r*=.68.

Collective action support. Supporting our key hypothesis, individual group members supported collective action to a significantly greater extent when their collective autonomy was restricted (*M*=5.79, *SD*=.95) rather than supported by the high-power outgroup (*M*=4.85, *SD*=1.44), γ=.89, 95%*CI* [.61, 1.17], *t*(102.33)=6.24, *p*<.001, *r*=.53. Independently, group members supported collective action to a significantly great degree when they were treated unequally (*M*=5.59, *SD*=1.10) rather than treated equally by the high-power group (*M*=4.92, *SD*=1.46), γ=.59, 95%*CI* [.31, .87], *t*(102.46)=4.13, *p*<.001, *r*=.38. There was no significant autonomy (support *vs.* restriction) x work distribution (equal *vs.* unequal) interaction on participants' collective action support, γ=-.25, 95%*CI* [-.80, .31], *t*(101.70)=-.86, *p*=.39, *r*=.14. Moreover, simple slope analysis for multilevel data (Preacher, Curran, & Bauer, 2006) confirmed that group members who had their collective autonomy restricted (*vs.* supported)

endorsed collective action to a significantly greater extent both when they were treated unequally, *y*=.78, *SE*=.19, *z*=4.12, *p*<.001, *and* when they were treated equally by the high-power group, *y*=1.03, *SE*=.22, *z*=4.78, *p*<.001. Thus, beyond experiencing the injustice of unequal treatment, restrictions to collective autonomy appear to uniquely promote low-power group members' support for collective action.

Consistent with the results we observed at the individual group member level, we also find further evidence at the group level that beyond general threats of injustice, restrictions to collective autonomy uniquely contribute to a group's support for collective action. Two-way ANOVA revealed that groups supported collective action to a significantly greater extent when their collective autonomy was restricted (*M*=6.10, *SD*=.77) rather than supported (*M*=5.33, *SD*=1.07), *F*(1,98)=20.17, *p*<.001,η^2=.17. Moreover, groups supported collective action to a significantly greater degree when they were treated unequally (*M*=6.00, *SD*=.77) rather than treated equally on the work task (*M*=5.42, *SD*=1.13), *F*(1,98)=12.24, *p*<.001,η^2=.11. There was no significant interaction, *F*(1,98)=.05, *p*=.83,η^2=.00 : Groups which had their collective autonomy restricted (rather than supported) endorsed collective action to a significantly greater extent both when they were treated unequally on the work task, *Mean Difference* =.75, *SE*=.25, *p*=.003, 95% *CI* [.26, 1.24], and when they were treated equally on the work task, *Mean Difference* =.83, *SE*=.25, *p*<.001, 95% *CI* [.33, 1.33].

System justification. Also supporting our key hypothesis, individual group members justified their social system to a lesser degree when their collective autonomy was restricted (*M*=2.76, *SD*=1.16) rather than supported by the high-power outgroup (*M*=4.02, *SD*=1.54), γ=-1.15, 95%*CI* [-1.47, -.83], *t*(99.60)=-7.00, *p*<.001, *r*=.57. Independently, individual group members justified their social system to a lesser degree when they were treated unequally

(*M*=2.90, *SD*=1.20) rather than treated equally on the work task (*M*=3.99, *SD*=1.61), γ=-5.72, 95%*CI* [-1.27, -.62], *t*(99.92)=-5.72, *p*<.001, *r*=.50. There was also a significant interaction between the collective autonomy restriction condition and the unequal treatment condition on participants' system justification, γ=.74, 95%*CI* [.11, 1.37], *t*(99.68)=2.27, *p*=.03, *r*=.22. Specifically, the effect that restrictions to collective autonomy had on reducing system justification was even stronger when groups were treated equally, *y*=-1.55, *SE*=.24, *z*=-6.49, *p*<.001, than when they were treated unequally, *y*=-.82, *SE*=.22, *z*=-3.74, *p*<.001. Critically however, the effect of collective autonomy restriction (*vs.* support) on system justification was robust *both* when groups were exploited and when treated equally on the work task. Thus, restrictions to collective autonomy appear to uniquely disrupt low-power group members' tendency to justify their social system.

Again, consistent with the results observed at the individual group member level, we also find at the group level that beyond equal versus unequal treatment, restrictions to collective autonomy uniquely contribute to low-power groups challenging the social system that disadvantages their group. Groups justified their social system to a significantly lesser degree when their collective autonomy was restricted (*M*=2.44, *SD*=.84) rather than supported (*M*=3.55, *SD*=1.51), *F*(1,98)=26.23, *p*<.001,η^2=.21. Groups also collectively justified their social system to a significantly lesser degree when they were treated unequally (*M*=2.55, *SD*=.92) rather than equally by the high-power group (*M*=3.46, *SD*=1.54), *F*(1,98)=17.97, *p*<.001,η^2=.16. There was no significant condition interaction, *F*(1,98)=1.08, *p*=.30,η^2=.01 : Groups that had their collective autonomy restricted (rather than supported) justified their social system to a significantly lesser degree both when they were treated unequally on the work task,

Mean Difference =-.91, *SE*=.31, *p*=.004, 95% *CI* [-1.56, -.29], and nwhen they were treated equally on the work task, *Mean Difference* =-1.38, *SE*=.32, *p*<.001, 95% *CI* [-2.01, -.74].

Behavioral group-level indices of collective action. Beyond relying on evidence from self-report indices of collective action, we investigated whether restrictions to groups' collective autonomy uniquely contributed to groups actually engaging in collective action. Providing some evidence for the validity of this behavioral outcome of collective action, it was significantly positively correlated to groups' self-reported support for collective action, *r*(98)=. 27, *p*=.007. Of the 103 groups, 19 groups (18.4 %) decided, of their own accord to engage in rebellious behavior during the work task. Specifically, 4 groups in the unequal treatment/collective autonomy supportive condition, 4 groups in the equal treatment/collective autonomy restriction condition, and 11 groups in the unequal treatment/collective autonomy restriction condition engaged in rebellious behavior. No group that had its collective autonomy supported and who were treated equally on the work task chose to engage in rebellious behavior. Binary logistic regression revealed that groups who had their collective autonomy restricted rather than supported were significantly more likely to engage in rebellious behavior during the work task, *b*=2.34, 95%CI*Exp(b)*[2.34,36.57], *W*=9.35, *p*<.001, Similarly, groups who were treated unequally by the high-power group were significantly more likely to engage in rebellious behaviors than groups who were treated equally, *b*=1.82, 95%CI*Exp(b)*[1.75,21.81], *W*=8.02, *p*=.005[31].

Behavioral group-level indices of system challenge. As a behavioral measure of groups' challenge and dissatisfaction of their social system we counted the number of times that group members within each group expressed dissatisfaction with or questioned the way that their group

[31] When including the interaction term the model did not converge because no participant assigned to the equal/collective autonomy support condition exhibited rebellious behavior and thus there was no variance within this cell.

had been treated during the experiment. Providing some evidence for the validity of this behavioral outcome of system challenge, we found that it was significantly negatively correlated to groups' ratings of system justification, $r(88)=-.37$, $p<.001$. Two-way ANOVA revealed that members within groups that had their collective autonomy restricted, $M=3.59$; $SD=2.81$, expressed significantly more dissatisfaction with their group's treatment on Grabodia relative to groups that had their collective autonomy supported, $M=.48$, $SD=.91$, $F(1,89)=51.39$, $p<.001$, $\eta^2=.37$. Group members who were treated unequally by the high-power group, $M=2.11$, $SD=2.63$, on the work task did not express significantly more dissatisfaction than group members who were treated equally, $M=1.92$, $SD=2.58$, $F(1,89)=.24$, $p=.62$, $\eta^2=.003$. There was no collective autonomy restriction by unequal treatment interaction, $F(1,89)=.24$, $p=.62$, $\eta^2=.003$: Groups that had their collective autonomy restricted (rather than supported) verbally expressed greater dissatisfaction both when they were treated unequally on the work task, *Mean Difference* =2.90, $SE=.61$, $p<.001$, 95% *CI* [1.69, 4.11], and when they were treated equally on the work task, *Mean Difference* =3.32, $SE=.62$, $p<.001$, 95% *CI* [2.01, 4.55].

Discussion

Consistent with the previous three studies, Study 4 provides further experimental evidence that when groups have their collective autonomy restricted (rather than supported) by a high-power group, they will be more likely to support collective action and less likely to justify their social system. Furthermore, we observed support for these conclusions both at the individual group member level, and at the group level. Moving beyond self-report measures, Study 4 provides rich behavioral evidence that groups that have their collective autonomy restricted (rather than supported) will be more likely to actually engage in collective action. Specifically, groups that lacked collective autonomy were significantly more likely to find ways

to protest an important societal work task by either refusing to work altogether, by deliberately sorting the wrong (and potentially dangerous) types of mana-beads, or by secretly hording mana-beads without the high-power outgroup's knowledge, in order to use them against them at a later time. Moreover, as they worked, low-power group members who had their collective autonomy restricted rather than supported were significantly more likely to verbally express discontent with how they were treated by the high-power group and to challenge their social system. In contrast, being treated unequally rather than equally by the high-power group did not significantly increase verbal expressions of dissatisfaction.

Study 4 also provides compelling evidence both at the individual group member level, and at the group level, that perceived restrictions to collective autonomy are distinct from general perceptions of being treated unjustly by a high-power group. Regardless of whether groups were treated equally or unequally on the work task, restrictions to collective autonomy (versus collective autonomy support) uniquely and significantly increased low-power group members' willingness to challenge their social system, their support for collective action, their actual engagement in collective action, and verbal expressions of discontent with their social system. Thus, the mobilizing effect of restrictions to collective autonomy versus collective autonomy support cannot be attributed simply to the high-power group acting in a negative rather than a positive manner towards the low-power group.

General Discussion

In the present research, we examined the unique role of collective autonomy threat— the restriction of a group's freedom to determine and practice its own culture—in mobilizing low-power groups to push for group empowerment. Across four different intergroup contexts involving both real-world cultural groups (Studies 1-2) and artificially constructed groups

(Studies 3-4), we documented correlational, experimental, individual-level, group-level, and behavioral evidence supporting our hypothesis that restrictions to collective autonomy play a unique role in predicting low-power group members' support for collective action for empowerment. This effect remained after accounting for other previously established factors such as discrimination, group identification, system stability and system legitimacy. Furthermore, we demonstrated that group members who experience collective autonomy support (vs. collective autonomy restriction) justify their social system to a greater degree despite being disadvantaged in other ways (i.e., by lacking societal influence, or being treated unequally by the high-power group), a conclusion further bolstered by a supplemental study (see Supplemental Study 1).[32]

Implications

The present research expands on previous theorizing and empirical research pertaining to the collective action intentions of low-power group members (Van Zomeren et al., 2008). One important feature of past models of collective action (e.g., Crosby, 1982; Drury & Reicher, 2009; Jost et al., 2017; Smith & Ortiz, 2002; Van Zomeren et al., 2008) is their consideration of how people's subjective experience of injustice may serve as a catalyst for collective action. A commonality of this past work has been its operationalization of injustice as being treated unequally or being relatively deprived in terms of access to scarce material resources (e.g.,

[32] In addition to the four studies reported in the main text, we conducted an additional laboratory experiment (see Supplemental Study 1). In this experiment, groups of 2-3 people imagined that they were a group of people living on a fictional planet along with another group. Groups were then asked to create a graphic novel illustrating the culture of both groups and how they the intergroup dynamics. Groups were assigned to one of three conditions: two in which they were low in power and learned that the high power group either restricted or supported their autonomy, and a third in which they were told that the two groups had equal power. Consistent with our main results, groups who were told that their collective autonomy was restricted (vs. supported) by a high-power group desired power for their group to a greater extent and described their group engaging in more hostile forms of collective action within the novel. Importantly, low power groups (i.e., who lacked resources and influence) who had their autonomy supported were not significantly different from groups in the equal power condition, indicating that collective autonomy support might lead groups to accept their otherwise disadvantaged position.

money, jobs) or symbolic resources (e.g., status) by the high-power group. To date however, no model has considered collective autonomy as a contributor to the collective action motives of low-power groups. Our findings provide the first empirical and experimental evidence for a novel factor—restrictions to a low-power group's collective autonomy (vs. collective autonomy support)—which serves a unique role in motivating low-power group members to engage in collective action. Speaking to its importance, collective autonomy restriction mobilized low-power group members regardless of whether they were treated unequally with respect to a tangible resource (i.e., assigned more than their fair share of work).

We also extend research on collective action processes by introducing novel and unique methodological approaches. Although collective action is, by definition, a group-based phenomenon, much of the existing literature on collective action has assessed *individual* group members' support or participation in collective action (Wright et al., 1990). Little research has actually assessed and/or attempted to manipulate the extent to which an entire *group* collectively engages in collective action. Furthermore, laboratory experiments investigating collective action seldom involve opportunities for individual group members to actually make direct contact with their fellow group members and freely interact with one another. In the experiments reported here, group members could act freely with their fellow group members as they formed a meaningful group identity and experienced either having or lacking collective autonomy. Moreover, Study 4 allowed us to unobtrusively observe whether groups would— of their own accord— generate ways to rebel against the high-power outgroup, in a controlled laboratory setting. Future research on collective action more generally may employ these or similar methods to assess how groups support and engage in collective action *as a group*.

The present research also expands on previous theorizing and empirical work pertaining to the tendency for disadvantaged group members to justify their social system (Jost et al., 2017), and a growing body of research demonstrating that paternalistic and benevolent actions on the part of the advantaged group might dissuade disadvantaged groups from engaging in collective action (Becker & Wright, 2011; Becker et al., 2013; Dixon et al., 2010; Jackman, 1994; Wright et al., 1990; Wright & Lubensky, 2009). To date, system justification theory (Hennes et al., 2012; Jost et al., 2017) has considered people's system justification motive as a function of their epistemic, existential and relatedness needs. The present research expands on system justification theory by providing experimental evidence that disadvantaged group members will also justify their social system to the extent that they can satisfy their collective need for autonomy, and in turn, their personal need for autonomy within their social system.

The present research findings are consistent with and extend Lammers and colleagues' (2016) work at the individual level, which suggests that individuals desire power to the extent that they lack personal autonomy. Here, we find that the same holds true at the intergroup level: Group members will seek to change the power status of their group to the extent that they lack collective autonomy. This finding also broadens self-determination theory, which argues that individuals will not be able to legitimize their own cultural group or political system when they feel that their *personal* autonomy is restricted within these contexts (Ryan & Deci, 2017). Here, we provide initial empirical evidence that individuals will find it difficult to justify intergroup contexts where the *collective* autonomy of their ingroup is restricted (rather than supported) by other groups.

Limitations and Future Directions

Despite its contributions, it is important to recognize the limitations of the present research and the new questions it poses. An important goal of the present research was to maximize the external validity of the experimental studies (Studies 3, 4) by using intensive simulation techniques within the controlled confines of the laboratory. However, it is important to acknowledge that these experiments cannot fully re-create the experience of actually being denied the autonomy of practicing one's own real culture. We address this limitation in part by also testing our hypotheses with real-world groups (i.e., Studies 1 and 2). An approach for future research may be to employ naturalistic experiments in which the impact of real-world threats to collective autonomy— such as a new policy restricting the cultural practices of a specific ethnic group— are assessed.

Another limitation of the present research is that we did not compare groups in the collective autonomy restriction and support conditions to a condition in which the high-power group acts in a strictly neutral manner. This makes it more difficult to disentangle whether effects were driven primarily by autonomy restrictions leading to mobilization versus autonomy support leading to appeasement. In our supplemental study, we did have a condition in which groups were of equal power to the outgroup and were provided with no other information about their group's relation with the outgroup. In this study we found that group members who had their collective autonomy restricted tended to desire more power than those in the equal power condition and described their group engaging in more hostile collective action towards the outgroup in a graphic novel. In contrast, no differences were observed between those in the equal power condition and the collective autonomy support condition. Nevertheless, future work should examine this question more systematically.

Relatedly, it is important to acknowledge that in Study 4 we find that the unequal versus equal treatment of the low-power group by the high-power group still increased low-power group members' collective action tendencies even when their collective autonomy was supported, suggesting that collective autonomy support will not inevitably cause group members to acquiesce completely to other forms of disadvantage. Future work will be needed to fully examine the range of societal disadvantage that low-power group members might be willing to accept when their collective autonomy is supported rather than restricted.

An important avenue for future research will be to examine if some high-power group members may endorse policies which support the collective autonomy of low-power group members in order to strategically appease low-power group members. Consistent with this idea, previous research finds that some high-power group members may strategically attempt to placate low-power groups by supporting certain affirmative action policies which benefit the low-power group (Chow, Lowery, & Hogan, 2013) or by voting token members of the low-power group into public office (Knowles, Lowery, & Schaumberg, 2009). Similarly, 'empowering' low-power groups by explicitly promoting them to practice their culture may be an especially enticing strategy for high-power groups to quell the potential dissatisfaction and uprising of low-power groups, at little tangible cost to their own ingroup. Indeed, through collective autonomy support, high-power groups may be able to appease low-power groups while delaying other substantive claims to valuable resources on the low-power group's agenda (Kteily, Saguy, Sidanius, & Taylor, 2013). At the same time, however, it is likely that some high-power group members who support the collective autonomy of low-power groups do so primarily because they have a genuine desire to empower low-power group members and respect their basic psychological needs. It will be important for future research to consider this, and to

test if there are forms of collective autonomy support that might strictly empower low-power group members without reducing their motivation to collectively promote the best interests of their group, and challenge other social policies which might disadvantage their group.

More research will also be needed to investigate whether in certain contexts low-power group members might actually justify their social system despite enduring restrictions to their collective autonomy. At the individual level, research by Laurin and colleagues demonstrates that individuals might rationalize the restriction of their personal freedoms by their own ingroup, when these restrictions are perceived as absolute and indisputable (Laurin, Kay, & Fitzsimons, 2012; Laurin, Kay, Proudfoot & Fitzsimons, 2012). Similarly at the intergroup level, it might be the case that low-power group members justify their social system, despite lacking collective autonomy, when they perceive their lack of collective autonomy to be absolute and unchangeable. For example, it might ironically be the case that low-power groups who are forbidden from practicing any aspects of their culture may be more likely to system justify than low-power groups who are told they can practice their culture under certain conditions.

Another direction for future research will be to consider potential factors that might modulate the impact of collective autonomy restriction/support on group members' collective action and system justification motives. Past models of collective action have considered how group identification and group efficacy might augment perceptions of injustice and moderate the effect of injustice on collective action (Van Zomeren et al., 2008). We did not consider these questions with respect to collective autonomy here, but they would be well-suited for future research. For example, it may be that more strongly identified group members perceive greater restrictions to their collective autonomy, in the same way that more strongly identified group members are prone to perceiving injustices against their group (Van Zomeren et al., 2008).

Furthermore, group members' willingness to engage in collective action in response to restrictions to their collective autonomy might be moderated by their perception that such acts will actually be efficacious in restoring collective autonomy to their group (Kelly & Breinlinger,1996; Klandermans, 1984; Mummendey et al., 1999).

Conclusion

Experiencing restrictions to collective autonomy threatens individuals' basic needs and mobilizes low-power group members to seek out group empowerment and engage in collective action to challenge the social system. In sharp contrast, having one's collective autonomy supported might lead to acquiescence even in the face of objective disadvantage. The present research thereby speaks to the two sides of collective autonomy threat: whereas restrictions to collective autonomy may come at a steep psychological cost to group members, they also appear to motivate group members to improve the overall situation of their group.

GENERAL DISCUSSION

Political theorists and the international community widely recognize that all nations, and all peoples within nations, have the right to freely self-determine their own culture, identity, and destiny (Charter of the United Nations, 1945; ICESCR, 1966; Kirgis, 1994; Margalit & Raz, 1990). Violations of this right may give rise to longstanding and bloody intergroup conflicts, in which the oppressed group fights to regain its freedom for group members to self-determine their own culture and destiny as a people. Yet despite the ubiquitous nature of issues pertaining to group-based self-determination in the real world, no research has empirically investigated the psychological consequences of having, as opposed to lacking, group-based self-determination for individual group members or for intergroup relations more broadly.

In this thesis, I addressed the paucity of empirical research concerning group-based self-determination within the social-psychological literature. Specifically, I introduced the concept of *collective autonomy*: Group members' perception that their group is free to determine and practice their own culture openly in society. In doing so, I documented the important impact that feeling or not feeling collectively autonomous has for the psychological adjustment and well-being of group members and, additionally, the consequences of such perceptions for the relations between groups of unequal power. Furthermore, I positioned the concept of collective autonomy within the theoretical frameworks of social identity theory (Tajfel & Turner, 1979) and self-determination theory (Ryan & Deci, 2017).

The first overarching question addressed in my program of research was: Is the extent to which individuals feel a sense of personal autonomy, in part, impacted by their perceptions of collective autonomy? Guided by social identity theory (Tajfel &Turner, 1979; Taylor, 1997, 2002), I argued that the answer is yes: Because so much of one's personal sense of self, daily

behavior, and daily experience is derived from their social (cultural) identity, I reasoned that, when individuals feel that their social group lacks collective autonomy, they will also feel personally controlled and restricted as individuals.

Strong evidence supporting this initial hypothesis was provided in Manuscript 1. Among three culturally diverse global community samples, group members' perception of collective autonomy with respect to their core cultural group was positively associated with their own personal sense of autonomy. Across these samples, the relation between collective autonomy and personal autonomy remained intact even when accounting for other potentially overlapping variables that have been considered previously in the self-determination theory literature (personal regulatory style, personal autonomy support) and the social identity theory literature (group identification, group power, collective efficacy, collective control, group distinctiveness, and perceived discrimination). Moreover, providing evidence for the cross-cultural generalizability of this finding, the relation between collective autonomy and personal autonomy was robust when we re-analyzed responses specifically from participants who were from an Eastern collectivistic culture (India) or a Western individualistic culture (United States of America).

Manuscript 1 also provided strong experimental evidence for a positive relation between collective autonomy and personal autonomy. In an intensive laboratory simulation experiment, group members who were prevented from acting in accordance with their cultural identity reported experiencing significantly less personal autonomy. Complementing this laboratory experiment, I found that group members who were asked to recount an experience in which their core cultural group lacked (rather than had) collective autonomy reported experiencing less personal autonomy as individuals. Together, these two experiments provide rich cross-contextual

evidence that lacking collective autonomy as a group might lead individual group members to feel personally deprived of autonomy as individuals.

Next, I investigated the potentially important downstream consequences of collective autonomy for group members' psychological well-being and for intergroup relations. With respect to well-being outcomes, decades of SDT-based research has found a robust and universal positive relation between personal autonomy and psychological well-being (Ryan & Deci, 2017). On this basis, I reasoned that, if deficits in collective autonomy are indeed detrimental to personal autonomous need satisfaction, then deficits in collective autonomy may also have an indirect adverse effect on psychological well-being. Direct support for this hypothesis is provided in Manuscript 1. Preliminary (supplemental) analysis of the three correlational studies revealed that group members who experienced greater collective autonomy also tended to experience greater personal psychological well-being. Importantly, this relation between collective autonomy and psychological well-being was mediated by personal autonomy: It was because of the impact that collective autonomy had on group members' personal autonomy, that collective autonomy also impacted group members' psychological well-being. Experimentally and directly testing my hypothesis, I found that, when group members described a time in which their cultural group lacked, rather than had, collective autonomy, they reported experiencing less psychological well-being. Again, supporting my mediation hypothesis, the effect of condition on psychological well-being was due to the impact that condition had on group members' personal autonomy. In sum, this thesis provides consistent evidence that group members' perceptions of collective autonomy relates to their psychological well-being.

Beyond examining the implications of collective autonomy for individual group members' psychological adjustment, an important objective of my research program was to

examine the implications of collective autonomy for intergroup relations. In this regard, I examined whether being deprived rather than granted collective autonomy by a high-power group, might mobilize low-power group members to pursue more power for their group, to challenge their social system, and to engage in collective action. I reasoned that, because collective autonomy has such important consequences for the psychological need satisfaction of group members and their psychological well-being (demonstrated in Manuscript 1), low-power group members would be motivated to restore their group's collective autonomy when it was threatened by a high-power group.

Manuscript 2 provided strong support for this hypothesis. Among a culturally diverse global community sample, and among a community sample of African-Americans, experiencing a collective-autonomy threat was associated with group members having a greater desire for group power, less of a willingness to justify their present social system, and ultimately, greater support for collective-action initiatives. Importantly, the relation between collective autonomy and these outcomes remained intact when controlling for several other constructs previously associated with collective action and system justification including group identification, social-dominance orientation, perceived discrimination, and socio-structural variables (Mummendey et al., 1999; Jost et al., 2017; Van Zomeren et al., 2008). Moreover, across two intensive laboratory experiments, I found that threatening a group's collective autonomy promoted group members to desire more power for their group, to challenge their social system, and to support collective action. This pattern of results was found when assessing these outcomes at the individual-group-member level, and at the group level. Moreover, collective-autonomy threat, compared to autonomy support, promoted greater collective action and reduced system justification regardless of whether groups were treated equally or unequally by the high-power group. Together, these

results indicate that threats to collective autonomy may motivate group members to engage in collective action, beyond other forms of perceived injustice (i.e., deprivation of resources, unequal treatment) that are found to mobilize group members.

In sum, the results of Manuscript 1 and Manuscript 2 provide robust evidence that collective autonomy has an important and unique impact on the psychological need satisfaction and well-being of individual group members, as well as on the relations between low-power and high-power groups. I now discuss the theoretical and practical/applied implications of this research, as well as potential avenues for future research.

Theoretical Implications and Future Directions for Self-Determination Theory

At the individual level, the concept of personal autonomy has received substantial research attention. Specifically, self-determination theory (SDT; Ryan & Deci, 2017) proposes that, along with the need to feel competent and related to others, people have a universal psychological need to feel personally autonomous. Because of the psychological significance of personal autonomy, an important objective of SDT is to identify what antecedent factors promote individuals to feel personally autonomous. To date, the majority of this research has focused on the type of support that individuals personally receive in their interpersonal relationships, and the types of motives, aspirations, goals, and regulatory styles that drive behaviour (Ryan & Deci, 2000a). In this way, self-determination theory has traditionally studied the psychology of *autonomy* with a focus on the individual and his or her *proximal* social (interpersonal) contexts.

More recently however, there is a growing recognition amongst self-determination theorists that *pervasive* social contexts, such as cultural and religious identities, and political and economic systems, may be important to consider with respect to individuals' personal autonomy (Amiot & Aubin, 2013; Amiot & Sansfacon, 2011; Amiot, Sansfacon, & Louis, 2013; Amiot,

Sansfacon, Louis, & Yelle, 2012; Chirkov et al., 2003; Downie et al., 2007; Thomas et al., 2017; see Ryan & Deci, 2017 for review). This research differentiates between the autonomous versus controlled reasons that group members might have for engaging in their cultural customs and practices (Chirkov et al., 2003; Downie et al., 2007), for conforming to the norms of their social group (Amiot et al., 2013; Amiot et al., 2012), and even for identifying with their group altogether (Amiot & Aubin, 2013; Amiot & Sansfacon, 2011). As well, group members' meta-perceptions as to whether they think that their fellow group members follow group norms for relatively autonomous versus controlled reasons has been considered in relation to personal autonomy (Thomas et al., 2017). The take-home message from this growing body of research is clear: Having autonomous rather than controlled reasons for practicing one's culture, customs, and norms, and for identifying with one's social group, promotes greater autonomous need satisfaction and psychological wellbeing. Moreover, thinking that the other members of one's group have autonomous rather than controlled reasons for following the norms of their group also promotes one to experience a greater sense of personal autonomy.

Importantly, however, this past research – despite its consideration of social identity, group identification, and even people's meta-perceptions of the motives that drive other ingroup members – is still very much focused on the *individual.* Indeed, it focuses solely on *intragroup* processes and on the *personal reasons* that drive *individual* group members to identify with their group and to practice their group's culture.

My research builds on self-determination theory by introducing, for the first time, people's perception of collective autonomy with respect to their entire social group, as an entity, in an *intergroup* context. Thus, the question addressed in this thesis is *not* "Do I and my fellow group members have autonomous reasons for practicing our culture?" but rather, "Do members

of my group have the freedom to choose how we define our culture and whether or not we can practice our culture?" In this thesis, I document robust experimental laboratory evidence and real world cross-cultural evidence that this novel construct of collective autonomy relates to autonomous need satisfaction and psychological well-being above the aforementioned factors previously considered within SDT. On this basis, I argue that it is important for future research operating within the SDT framework, which focuses on personal autonomy as a core variable, to account for the potentially important impact that collective autonomy might have on personal autonomy.

In order to position the concept of collective autonomy within the theoretical framework of self-determination theory, it is important to clarify differences between how SDT theorists have traditionally conceptualized personal autonomy at the individual level and how I conceptualize collective autonomy at the group level.

At the interpersonal level, SDT theorists make an important distinction between personal autonomy and personal independence. SDT proposes that individuals can still maintain their personal autonomy while at the same time following the guidance, direction, and support of other important people in their lives (Chirkov et al., 2003). Thus, SDT theory is careful to make it clear that, by emphasizing the psychological importance of personal autonomy, it does *not* suggest that it is adaptive for individuals to live independently from the direction of others or to do whatever they please without any structure in their lives. This distinction between personal autonomy and personal independence is especially relevant within interpersonal contexts involving individuals of unequal power, such as parent-child, teacher-student, and doctor-patient relationships: Within these contexts, it is normative and often adaptive for the low-power individual to take guidance and direction from the high-power individual. What SDT argues is

critical, however, is that when low-power individuals do receive direction and structure from the high-power individual, they receive it in an empathic and autonomy-supportive manner. Yet, an important implicit assumption made by SDT in this regard is that the high-power individual will use autonomy-supportive techniques in a genuine and altruistic manner, in order to ensure the best outcomes for the low-power individual (Williams et al., 1996; Ryan & Deci, 2017). For example, it is assumed that, when doctors or teachers provide their patients or students with guidance, they do so with the patient's or students' best interests in mind. Indeed, it is through empathisizing with, and taking the perspective of, the person receiving autonomy support, that SDT proposes that the individual providing autonomy support will be cognizant of what that person needs and requires (Williams et al., 1996; Ryan & Deci, 2017).

Within the context of intergroup relations, however, it cannot be assumed that groups will necessarily have the best interests of other outgroups at heart. In contrast, it is well documented that ingroups have a bias towards their own group, and are primarily concerned with their own group's best interests rather than those of other groups (Brewer, 1999; Halevy, Bornstein, & Sagiv, 2008; Tajfel & Turnrer, 1979; Weisel & Böhm, 2015). Thus, because of the competitive nature of intergroup relations, groups may be reticent to follow guidance and direction from other groups. Furthermore, it is theorized that groups have a psychological desire to maintain a social identity that is relatively distinct from that of other groups (Tajfel, & Turner, 1979). This desire for distinctiveness may contribute further to a group's reluctance to follow the guidance or directives of other groups when it determines and defines its own culture and identity. For example, taking on the customs and practices of another group may be threatening to the distinctiveness of one's own group. Instead, to preserve their distinctiveness, groups may prefer crafting out their own identity and culture on their own accord, without input from other groups.

On this basis, relative to how personal autonomy support is conceptualized within interpersonal contexts, at the intergroup level, I argue that collective autonomy support involves less of an active provision of guidance, direction, and support. Rather, I conceptualize collective autonomy support as often involving a more passive form of respecting an outgroup's own independent cultural development, without necessarily providing the group with direct guidance and options for how to determine their culture.

A further important distinction necessary to position collective autonomy within SDT is whether or not collective autonomy should be conceptualized as a basic psychological need, as is the case for personal autonomy. Self-determination theory has conceptualized personal autonomy as a universal and basic psychological need (see Ryan & Deci, 2017). This claim is founded on the basis of over 30 years of data from numerous countries of different cultural backgrounds, which demonstrate a unique and robust positive association between personal autonomy, and psychological and physical well-being. In this thesis, I have demonstrated a robust positive relation between collective autonomy and personal autonomy across a diverse array of different intergroup contexts. However, while I also found evidence of a positive relation between collective autonomy and psychological well-being, this relation was mediated by personal autonomy. In other words, my data indicates that collective autonomy impacts psychological well-being, because of its implications for group members' personal autonomy. For this reason, I do not conceptualize collective autonomy as a unique basic psychological need in and of itself. Rather, my data suggests that collective autonomy, like personal autonomy support, and personal regulatory style, is an essential psychological nutrient necessary for individuals to satisfy their basic psychological need for personal autonomy (Vansteenkiste & Soenens, 2015).

At the same time however, I do argue that groups have a *collective need* and motivation to maintain their collective autonomy insofar as collective autonomy is necessary for group members to maintain their personal autonomy. Supporting this claim is the robust real-world and experimental-laboratory evidence provided in Manuscript 2, which demonstrates that groups who are deprived of their collective autonomy become highly motivated to restore their group's collective autonomy. For example, in Study 4 of Manuscript 2, group members who were robbed of their collective autonomy verbally objected to these restrictions and engaged in actual rebellious behavior towards the high-power outgroup in response. These findings provide *un-prompted* behavioural evidence that group members do indeed care about their collective autonomy and will go to great lengths in order to restore it. In this context, groups had only recently created their group identity with respect to a newly formed and artificial group. In real world contexts, when groups are robbed of a cultural identity which they have likely known since birth, and that likely has profound emotional significance to them and their fellow group members, their collective need to restore their collective autonomy may be especially great.

It is also important to acknowledge that my theoretical framework has yet to consider how the two other basic and universal psychological needs which are central to SDT, competence and relatedness, might be impacted by one's intergroup context. At the individual level, SDT proposes that, along with their need to feel personally autonomous, individuals also have a basic psychological need to feel personally competent and related to others (Ryan & Deci, 2017). Thus, a logical extension of the present research will be to also consider how intergroup factors might impact personal relatedness and personal competence. To date, no SDT-oriented research has explicitly related competence or relatedness to individuals' perception of their intergroup context. Importantly however, there is already substantial research, independent of

SDT, describing how social identity and intergroup factors might impact people's personal sense of relatedness and competence.

With respect to relatedness needs, Branscombe, Schmitt, & Harvey's (1999) rejection-identification model of discrimination considers how being the target of prejudice and discrimination might negatively impact psychological well-being by causing individuals to feel rejected and disconnected from their society. Moreover, this model also considers how stigmatized group members might off-set these adverse effects of discrimination on their sense of relatedness, by increasing their sense of relatedness to other members' of their own group (Branscombe et al., 1999) and even members of other stigmatized groups (Craig & Richeson, 2012). Substantial theory and research also considers how being the target of prejudice and discrimination may adversely impact individuals' competence needs (Crocker & Major, 1989; Schmader, Johns, & Forbes, 2008; Steele & Aronson, 1995). For example, research on *stereotype threat* documents that people's awareness of negative stereotypes pertaining to their group's competence in specific domains can lead to impaired performance in these domains, as well as more global deficits in well-being and self-control capacity (see Schmader et al., 2008 for review). On the other hand, Crocker and Major (1989) find, non-intuitively, that members of stigmatized groups might also protect their personal sense of competence by attributing personal failures to their stigmatized group membership. In sum, these different theoretical perspectives describe the profound impact that people's perceptions of their social groups in an intergroup context might have on their psychological needs for relatedness and competence.

It was beyond the scope of the present thesis to consider how all three basic psychological needs (autonomy, competence, relatedness) might be impacted by people's perceptions of their social group in an intergroup context. Moreover, because no research within

or outside of SDT has considered how intergroup contexts might impact personal autonomy, I chose to focus on this issue first. However, it will be important for future research to test an integrated model that considers simultaneously all three of the basic psychological needs. Doing so will provide a complete theoretical model detailing how intergroup factors might impact people's three core psychological needs for competence, relatedness, and autonomy.

In sum, the present thesis expands upon the existing self-determination-theory framework by considering for the first time how individuals' perception of collective autonomy within an intergroup context might impact their own sense of personal autonomy and, in turn, their psychological well-being. Avenues for future research include a greater consideration of intergroup contexts within SDT-based research. As well, further investigation as to how people's satisfaction of their three basic needs for autonomy, competence, and relatedness might be impacted by their perception of their social group in an intergroup context is needed.

Theoretical Implications and Future Directions for Social Identity Theory

The present thesis also has important theoretical implications for social identity theory (SIT; Tajfel & Turner, 1979). A growing body of SIT-based research investigates how group members' personal experience and self-concept is shaped by their social identity. For example, 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 and aspirations (Oyserman et al., 2006; Fryberg et al., 2008) have been found. Building on this literature further, the present thesis provides strong evidence of a positive association between collective autonomy and personal autonomy.

The present research also introduces *collective autonomy threat* as a unique form of identity-based threat within the SIT framework. Previous research conducted within the SIT framework considers the impact of identity-based threats on group members' well-being and on intergroup relations (e.g., Branscombe et al., 1999; Stephane et al., 2004). Two important types of threat described by this research are: (1) threats to the positive value of one's social identity, and (2) threats to the distinctiveness of one's social identity relative to other groups (Tajfel & Turner, 1979). Importantly, the present findings indicate that, when controlling for perceived threats to the positive value of one's group and distinctiveness threat, collective autonomy threat still relates, uniquely, to group members' personal autonomy and psychological well-being. From the perspective of SIT, it is reasoned that group members are motivated to maintain a positive and distinct social identity because having a positive and distinct social identity reflects positively on their own personal sense of self-worth or self-esteem (Crocker et al., 1994; Hogg & Abrams, 1990; Luhtanen & Crocker, 1992; Oakes & Turner, 1980; Rubin & Hewstone, 1998; Turner et al., 1979; Turner, 1982). Thus, maintaining the positive distinctiveness of one's social identity is important insofar as it has consequences for self-esteem, an important psychological need (Leary, Tambor, Terdal, & Downs, 1995). My rationale for why group members desire collective autonomy is complementary: It is because of the impact that collective autonomy has on personal autonomy, also an important psychological need, that group members desire collective autonomy. By introducing the concepts of collective autonomy and personal autonomy into the theoretical framework of social identity theory, this thesis broadens SIT in an important way: Specifically, I document how social identity might impact other basic psychological processes (i.e., autonomy), beyond self-esteem.

In the present thesis, I theorized that it is because of the profound psychological impact that group members' social identity has on group members' self-concept and personal experience, that group members' sense of personal autonomy might be directly associated with their collective autonomy. An avenue for future research will be to test whether the extent to which group members feel that their own personal experiences and personal identity are shaped by their social identity might moderate the extent to which their personal autonomy is impacted by their group identification. Supplemental analyses conducted in the present thesis revealed that group members' level of group identification did not reliably moderate the strength of the relation between their collective autonomy and their personal autonomy. A potential explanation for why the relation between collective autonomy and personal autonomy was not conditional on group identification in the present set of studies, was because participants were specifically asked about a cultural identity that they felt was most *core* to their personal sense of self. As a result, participants tended to identify highly with their group, and there may not have been adequate variance to detect moderation. However, it might also be that the extent to which group members' personal autonomy is impacted by their collective autonomy is not conditional on group identification per say. Rather it may be group members' more specific perception that they are personally impacted by what happens to their social group that will moderate the relation between collective autonomy and personal autonomy. Supporting this idea, a recent study finds that, among members of the LGBTQ+ community, an experimental manipulation of collective autonomy had the greatest impact on the personal autonomy and psychological well-being of group members who felt that they were personally affected by collective experiences impacting the LGBTQ+ community as a whole. In contrast, community members' level of group

identification to their LGBTQ+ community did not moderate these effects (Cooligan, Kachanoff, Caouette, & Wohl, 2017).

In sum, the present thesis expands upon the existing social identity theory framework by introducing a new psychological mechanism through which people's self-concept and personal experience might be impacted by their social identity: The link between collective autonomy and personal autonomy. Moreover, I introduce collective autonomy threat as a novel form of identity-based (symbolic) threat with its own unique implications for group members' psychological well-being and the extent to which low-power group members support collective action. Avenues for future research involve a further investigation of potential factors that might moderate the extent to which group members' personal sense of autonomy is affected by their perception of collective autonomy. Moreover it will be important to integrate the concepts of collective autonomy and personal autonomy into more global models of social identity that seek to understand the impact of social identity on the self (Tajfel & Turner, 1979; Taylor, 1997; Turner et al., 1987).

Practical Implications

For members of relatively high-power groups, having the freedom to openly express their cultural identity is often automatic, commonplace, and an assumed right. In contrast, however, the freedom for members of relatively low-power groups to determine and practice their own culture is more tenuous. There are many instances in which relatively low-power groups are indeed free in their society to openly practice their culture: One needs only to visit Chinatown or Little Italy in a major North American city to see ethnic minorities freely and openly expressing their cultural identity. However, it is also the case that members of low-power groups might be stripped of their freedom to determine and express their cultural identity. As I have described,

instances of forceful colonization, slavery, and laws that place restrictions on how certain groups practice their culture all pose threats to a group's collective autonomy. Within Canada, the treatment of Indigenous peoples in the residential-schooling system, and more recently, the proposed Quebec bill that sought to restrict how certain ethnic groups display their religious symbols in public, are examples of how a group's collective autonomy might be restricted. The findings reported in the present thesis, speak to the profound consequences that either maintaining collective autonomy or lacking collective autonomy may have for the well-being of group members and the quality of relations between groups.

Issues pertaining to collective autonomy may be especially relevant within the context of an increasingly globalized world. More and more, different ethnic, racial, and religious groups are becoming intermingled. For example, never before in recorded human history have more people been displaced from their homes and forced to seek refuge in other nations (UNHCR, Global Trends Report, 2016). Driven out by bloody internal conflicts, economic collapse, and natural disasters, an estimated 59.5 million people have been displaced as of 2016. To put this in perspective, this number is almost twice the entire population of Canada. This "crisis" of mass migration has become a pervasive global issue impacting both the millions of people seeking refuge and the billions of people residing in the various "receiving" countries asked to grant refuge. As the millions of displaced peoples and the countries receiving them struggle to cope with this shifting social landscape, both refugees and receiving group members alike may face threats to their collective autonomy. From the perspective of migrants, collective autonomy threats may involve them feeling that their group lacks the freedom to choose whether or not to practice their culture in their new homeland. Take, for example, Muslim refugees in France who are prevented by law from wearing their traditional religious clothing (burqas and niqabs) in

public spaces, whether they would like to or not (Adrian, 2015; Ramirez, 2014). Such laws, which restrict the cultural freedoms of migrants and seek to monitor and regulate their actions, pose direct threats to their collective autonomy. However, receiving group members may also experience collective autonomy threats insofar as they feel that the incoming mass of new peoples will interfere with their group's capacity to continue to define and practice its traditional culture. For example, political figures, such as U.S. President Donald Trump and French Mayor Robert Menard, have begun to publicly vocalize an increasingly commonly expressed anxiety among some receiving group members that the large numbers of refugees arriving in their nation — especially Muslim refugees — threaten their capacity to define and practice their National identity and culture (Nossiter, 2015). Indeed, in parts of the United States that are home to large numbers of predominantly Muslim refugees (e.g., Dearborn, Michigan), some Americans have expressed that they no longer feel welcome to practice their own traditional American culture, referring to these areas as "no-go zones" (Jenkins, 2015).

An avenue for future applied research will be to investigate how collective autonomy supportive interventions may promote the well-being of migrants and receiving group members and positive intergroup relations between them. For example, collective autonomy support by the receiving group towards the migrating group might entail explicit policy statements by the receiving group that refugee groups would be free to continue to choose to practice their culture of origin, should they so desire. For example, Canadian Prime Minister Trudeau has openly spoken against policies seeking to restrict the cultural freedom of ethnic minority groups within Canada, such as the restrictions placed on Muslim women wearing a niqab, stating that "those who would use the state's power to restrict women's religious freedom and freedom of expression indulge the very same repressive impulse that they profess to condemn" (Trudeau,

2015, cited from Wherry, 2015)[33]. On the other hand, collective autonomy support by the migrating group to the receiving group might involve the migrating group making it clear to the receiving group that they would attempt to respect the culture of the receiving group and be open to cues from the receiving group for how to behave in their new environment. This will reduce the chance of receiving-group members feeling that their own culture is being pushed out and suppressed by the emergence of the migrating group's culture. Because of the profound impact that feeling collectively autonomous has on people's experience of personal autonomy, it is possible that both receiving-group members and migrants may experience reduced psychological well-being if they feel that their collective autonomy is restricted because of mass-migration. Furthermore, threats to collective autonomy may, in turn, promote hostile intergroup relations between receiving-group members and migrants, as both groups may feel negatively that the outgroup did not respect or consider a basic need of their ingroup. Providing some support for these hypotheses, preliminary research has shown that, within the context of a laboratory simulation of a mass-migration context, mutual collective autonomy support, as opposed to collective autonomy threat, between the receiving and migrating group, promoted less prejudice and hostile intergroup behaviour between both parties (Kachanoff, Kteily, Cohen, & Taylor, 2017).

Within the context of a globalizing world, issues of cultural relativism have become more and more prevalent in public, political, and theoretical discourse (Bloom, 1987; Taylor, 2002). Cultural relativism refers to accepting all cultures and the differences among them as equal. Self-

[33] I do not seek to make a moral judgment as to the appropriateness of receiving group members' decision to impose or not impose restrictions on the cultural practices of the migrating group. Rather, I argue that research is needed to assess how such restrictions may adversely impact the well-being of refugee group members, and might promote migrants to harbor negative attitudes and engage in intergroup hostility towards the receiving group. Similarly, I make no claims about the morality of migrating group members choosing to support or not support the autonomy of receiving group members.

determination theorists acknowledge that the issue of cultural relativism is controversial within the SDT framework (Ryan & Deci, 2017; Ryan & Deci, 2012). Specifically, SDT argues that *not* all cultural values and practices are equally conducive to being practiced for autonomous reasons (i.e., internalized reasons) and, thus, may thwart peoples' basic psychological needs for autonomy, competence, and relatedness. For example, Ryan and Deci (2017) use the value of boys not being allowed to cry, girls not being allowed to receive an education, and the practice of female genital mutilation (infibulation), as examples of cultural values and practices that may be resistant to being fully internalized, and which might thwart one's basic psychological needs. I do not challenge the possibility that certain cultural practices may have adverse effects on group members' psychological need-satisfaction and I agree with Ryan and Deci's (2017) position that further empirical research is needed to test this hypothesis. However, I argue that issues of collective autonomy need to also be considered in this discussion and such future research. Indeed, when the cultural values and practices of a certain group are deemed as mal-adaptive by other groups within society, it may follow that laws and sanctions are imposed upon them, which restrict them from practicing these customs. I argue that such restrictions, even if imposed with well-meaning intent, have the potential to threaten group members' collective autonomy and, in turn, undermine their personal autonomy and well-being. Thus, a paradox arises: Restricting groups from practicing certain cultural customs that might thwart their basic psychological needs may have a positive impact on their psychological well-being; yet, at the same time, losing the collective autonomy to choose whether or not to practice these customs may be detrimental to personal autonomy and well-being. One potential solution and avenue for future research may be to devise collective autonomy supportive interventions for promoting groups to cease practicing certain customs that are empirically demonstrated to have negative consequences on their

psychological well-being and physical health. Such an approach may involve communicating to the target group, the practical benefits that restricting certain cultural customs within their group may have for their well-being. Yet, at the same time, it will be critical to explicitly acknowledge that it is ultimately the ingroup's choice to maintain or eliminate certain customs and values from their culture.

The research in the present thesis has focused on the psychological role of collective autonomy within intergroup contexts that pertain to group members feeling free, or not free, to define and practice their own culture. However, it is possible that issues of collective autonomy may also be relevant to intergroup contexts that do not directly pertain to the question of whether or not group members can practice and define their own culture. Specifically, collective autonomy issues may also be important in any intergroup context in which it is vital for a group to make a decision collectively and freely as a people, without the undue influence of other groups. For example, recent research has demonstrated that collective autonomy may play an important role in intergroup contexts involving intergroup apologies between a transgressing group and a victimized group (Kachanoff, Caouette, Wohl, & Taylor, 2017). Within interpersonal reconciliation contexts, it has been argued that apologies are useful in promoting victims to feel forgiveness towards the transgressor (Shnabel & Nadler, 2008). Specifically, the needs-based model of reconciliation argues that victims need to restore their sense of power before they will be willing to forgive the transgressing group. Apologies are thought to facilitate this process by allowing the victim to make the choice of whether to forgive the transgressor or not (Shnabel & Nadler, 2008). It is through choosing whether or not to forgive the transgressor that victims can restore their sense of power, which was threatened by the initial transgression. Extending this model to the intergroup level, we (Kachanoff and colleagues, 2017) argue that

group members have a need to feel that their group has collective autonomy when choosing to accept or refuse the apology offered by the transgressing group. We propose that it is by having the collective autonomy to choose whether or not to forgive the transgressing group that victims may restore their threatened sense of power. However, because of the public nature of intergroup apologies, the power differences that often exist between the transgressing and victimized group, and because transgressing groups may often insinuate an expectancy of forgiveness, victims may feel pressured to accept the apology offered by the transgressor – thus undermining their collective autonomy. Two experiments compared collective autonomy supportive apologies that supported the victims' choice to accept or refuse the apology, to collective autonomy unsupportive apologies, which insinuated an expectation of forgiveness. Compared to the collective autonomy unsupportive apology, the collective autonomy supportive apology promoted victims to feel empowered during the apology process, a greater sense that transgressing group was empathic towards them and, ultimately, greater forgiveness towards the transgressing group.

Lastly, it is important to recognize that, in the present thesis, I focused attention primarily on low-power groups because they are most at risk of having their collective autonomy threatened because of their relative dependence on the high-power group. This approach parallels research at the individual level that also considers how threats to personal autonomy might motivate low-power individuals to seek more personal power (Lammers et al., 2016). However, it is important to acknowledge that, in certain intergroup contexts, relatively high-power groups may also be prone to experiencing threats to their collective autonomy. For example, recent research by Danbold and Huo (2014) examines how the rising number of immigrants into the United States has caused White mainstream Americans to fear that mainstream American

identity will no longer be defined on the basis of their White identity, but on the basis of a diverse array of different ethnic identities. The authors refer to this type of threat as *prototype threat* as it reflects one's fear that their broader National identity will no longer be defined on the basis of prototypical group members of their own ethnic group. While Dunbold and Huo's research does not consider issues of collective autonomy specifically, I argue that issues of collective autonomy underlie why prototype threats are experienced as threatening to group members. Indeed, such threats reflect a loss of group members' freedom to determine how their broader National identity is defined (i.e., collective autonomy threat). The experience of prototype threats may be one context through which members of a relatively high-power group (in this example White Americans) might have their collective autonomy threatened by groups of relatively lower power (in this example ethnic minorities). Future research considering the underlying psychological processes for why majority group members experience prototype threats as psychologically distressing might look to consider the role of group members' perceptions of collective autonomy.

The collective autonomy of relatively high-power groups might also be undermined in intergroup contexts in which the high-power group is pressured by other groups within their society to comply with a shift in societal ideology or policy. For example, within the United States there is growing pressure placed on Whites (a high power group) to promote and accept greater ethnic diversity in the workplace, and in society more broadly. However, it has been documented that such pro-diversity initiatives are sometimes perceived as threatening by Whites, and may result in the backlash effect of Whites being less tolerant of diversity (Dover, Major, & Kaiser, 2016). Previous research indicates that diversity initiatives might be threatening to Whites because they are perceived as posing a potential threat to the status of their group (Dover

et al., 2016). In addition to the potential for pro-diversity policies to threaten the status of high-power group members, Whites may react adversely to pro-diversity initiatives because they perceive that their group has no collective autonomy in choosing whether or not to follow such initiatives. Indeed, pro-diversity policies are often described as initiatives for increasing equality and justice. As a result, it is almost implied that not supporting these policies is synonymous with acting in a prejudiced and discriminatory manner. This overall pressure and moral obligation within society placed on Whites to follow these policies may leave Whites as a group feeling that they have little choice but to conform to such policies. Supporting this idea, there is evidence at the individual level that, when people feel personally pressured within their society to act in a non-prejudiced manner, they might actually become more likely to be prejudiced (Legault, Gutsell, & Inzlicht, 2011). Similarly, at the intergroup level, it may be the case that when members of a high-power group feel that their group is given little choice but to support policies to help empower members of a low-power group, members of the high-power group may actually be more prone to resist these policies. An interesting avenue for future research might be to investigate if affirming the high-power group's collective autonomy to chose not to empower low-power groups, might actually *increase* their likeliness to empower low-power groups. For example, telling Whites that it is understandable for their group not to support pro-diversity policies (rather than their obligation) might actually increase rather than decrease their support of such policies.

Conclusion

Artists, philosophers, politicians, and psychological theorists have long proclaimed the profound psychological importance of feeling personally autonomous and volitional. The program of research described in the present thesis provides empirical evidence that people's

sense of personal autonomy is inherently linked to the collective autonomy of their social groups. Specifically, my findings indicate that it will be more difficult for people to satisfy their basic psychological need for autonomy within intergroup contexts in which the collective autonomy of their social group(s) is (are) restricted, rather than supported, by other groups. Moreover, the present research elucidates the important downstream consequences of experiencing collective autonomy for psychological well-being and the relations between members of high and low power groups. In doing so, this research positions collective autonomy as a novel, important, and unique psychological construct within the fields of human motivation and intergroup relations.

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APPENDIX A: Supplementary Analyses for Manuscript 1

Supplemental Analyses 1: Testing the relation between collective autonomy and personal autonomy controlling for group distinctiveness, collective control and group identification (Study 1, Manuscript 1)

We examined whether collective autonomy would relate to personal autonomy when accounting for the following additional potentially overlapping variables which were beyond the scope of the variables focused upon in our main-text analyses: group distinctiveness (Tajfel & Turner, 1979; Sample 1a, α=.75 & Sample 1b, α=.85), collective control (Tiessen, Taylor, & Kirmayer, 2009; Sample 1c, α=.69), and group identification (Doosje, Ellemers, & Spears, 1995; Sample 1a, α=.82; Sample 1b, α=.82; Sample 1c, α=.89). Please see the Supplementary Appendix for all scale items. Correlations between all variables reported in the main text and these additional potentially overlapping variables are reported in Table S1 (Sample 1a), Table S4 (Sample 1b), and Table S7 (Sample 1c).

For each sub-sample, we compared the proportion of variance in personal autonomy uniquely explained by collective autonomy relative to each potentially overlapping variable measured in each sub-sample. Specifically, we provide the squared semi-partial correlations between collective autonomy and personal autonomy, and between the potentially overlapping variable and personal autonomy. We report the squared semi-partial correlations for both the potentially overlapping variables described in the main text, as well as, the additional potentially overlapping variables described here in the supplemental analyses (See Table S2 for Sample 1a, Table S5 for Sample 1b, and Table S8 for Sample 1c). Collective autonomy accounted for a significant unique proportion of the variance in personal autonomy when controlling for each potentially overlapping variable.

For each sub-sample, we computed additional hierarchal linear regressions simultaneously controlling for the potentially overlapping variables reported in the main text, as well as the additional potentially overlapping variables described here in supplemental analyses (See Table S3 for Sample 1a, Table S6 for Sample 1b, and Table S9 for Sample 1c). In each sub-sample, collective autonomy accounted for significant variance in personal autonomy when simultaneously controlling for all potentially overlapping variables.

	M	*SD*	1	2	3	4	5
1.Collective Autonomy	4.58	1.01		.45***	.46***	.29***	-.15
2.Personal Autonomy	4.96	1.04			.26**	.25**	.02
3.Group Power	5.88	1.32				.51***	.22*
4.Group Identification	6.38	0.78					.23*
5.Group Distinctiveness	5.86	0.91					

**p<.05 , **p<.01 , ***p<.001*

Table S1: *Expanded correlation table for Sample 1a (Manuscript 1), including the additional potentially overlapping variables included in Sample 1a (i.e., group identification and group distinctiveness).*

	Group Power	Group Identification	Group Distinctiveness
Collective Autonomy	.15(.39)	.17(.41)	.21(.46)
Potentially Overlapping Variable	.004(.06)	.02(.14)	.01(.10)

Table S2: *Squared semi-partial correlations examining the unique relation between collective autonomy and personal autonomy, and each potentially overlapping variable and personal autonomy, when accounting for the other variable (Sample 1a, Manuscript 1). Each column pertains to a separate analysis including collective autonomy and the potentially overlapping factor listed at the top of the column. The non-squared semi-partial correlations are listed in parentheses.*

		β	*95% CI (lower limit)*	*95% CI (upper limit)*
Step 1.				
	Group Power	.17	-.03	.30
	Group Identification	.18	-.04	.51
	Group Distinctiveness	-.06	-.28	.14
Step 2.				
	Group Power	-.04	-.20	.14
	Group Identification	.13	-.09	.43
	Group Distinctiveness	.06	-.13	.27
	Collective Autonomy	.44	.26	.65

Table S3: *Hierarchal linear regression examining the unique effect of collective autonomy on personal autonomy when simultaneously accounting for all potentially overlapping variables that were measured in Sample 1a (Manuscript 1). The potentially overlapping variables were entered into the first step of the model. Collective autonomy was entered into the second step of the model. Significant beta coefficients are indicted when the 95% confidence interval does not contain 0. Accounting for all potentially overlapping variables, collective autonomy accounted for 6 percent of the variance in personal autonomy,* R^2_{change}*=.06,* F_{change} *(1,123)=8.52, p =.004.*

	M	*SD*	1	2	3	4	5	6	7
1.Collective Autonomy	4.59	0.97		.32**	.35**	.22*	-.02	.17*	.13
2.Personal Autonomy	4.85	1.12			.27**	.22*	.10	.36**	.31**
3.Group Power	5.97	1.21				.44**	.12	.42**	-.03
4.Group Identification	6.40	0.79					.32**	.57**	.29**
5.Group Distinctiveness	5.94	1.00						.35**	.19*
6.Personal Autonomy Support	5.56	0.91							.45**
7.Personal Regulatory Style	4.88	1.09							

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

Table S4: *Expanded correlation table for Sample 1b (Manuscript 1), including the additional potentially overlapping variables included in Sample 1b (i.e., group identification and group distinctiveness).*

	Group Power	Group Identification	Group Distinctiveness	Personal Autonomy Support	Personal Regulatory Style
Collective Autonomy	.06(.25)	.08(.29)	.11(.33)	.08(.28)	.09(.30)
Potentially Overlapping Variable	.03(.18)	.03(.16)	.01(.12)	.11(.33)	.08(.28)

Table S5: *Squared semi-partial correlations examining the unique relation between collective autonomy and personal autonomy, and each potentially overlapping variable and personal autonomy, when accounting for the other variable (Sample 1b, Manuscript 1). Each column pertains to a separate analysis including collective autonomy and the potentially overlapping factor listed at the top of the column. The non-squared semi-partial correlations are listed in parentheses.*

		β	*95% CI Lower limit)*	*95% CI (Upper Limit)*
Model 1.				
	Group Power	.23	.03	.38
	Group Identification	-.05	-.38	.23
	Group Distinctiveness	-.03	-.23	.16
	Personal Autonomy Support	.19	-.06	.51
	Personal Regulatory Style	.26	.07	.46
Model 2.				
	Group Power	.14	-.05	.31
	Group Identification	-.07	-.40	.19
	Group Distinctiveness	-.01	-.20	.18
	Personal Autonomy Support	.20	-.03	.52
	Personal Regulatory Style	.22	.03	.42
	Collective Autonomy	.23	.06	.46

Table S6: *Hierarchal linear regression examining the unique effect of collective autonomy on personal autonomy when simultaneously accounting for all potentially overlapping variables that were measured in the Sample 1b (Manuscript 1). The potentially overlapping variables were entered into the first step of the model. Collective autonomy was entered into the second step of the model. Significant beta coefficients are indicted when the 95% confidence interval does not contain 0. Accounting for all potentially overlapping variables, collective autonomy accounted for 4 percent of the variance in personal autonomy,* R^2_{change}*=.04,* F_{change} *(1,121)=6.90, p =.01*

	M	*SD*	1	2	3	4	5	6	7	8	9
1.Collective Autonomy	4.65	1.21		.31**	.35***	.26***	-.52***	.16**	.13*	.21***	.15**
2.Personal Autonomy	4.92	1.03			.17***	.25***	-.16**	.17***	.13*	.28***	.30***
3.Group Power	5.57	1.26				.55***	-.24***	.42***	-.07	.36***	.10
4.Collective Efficacy	5.98	.88					-.16**	.53***	.10	.50***	.29***
5.Group Discrimination	4.17	1.38						-.08	-.10*	-.13*	-.08
6.Group Identification	6.07	1.01							-.01	.61***	.34***
7.Collective Control	4.44	.93								.01	.34***
8.Personal Autonomy Support	5.39	.90									.39***
9.Personal Regulatory Style	4.96	1.04									

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

Table S7: *Expanded correlation table for Sample 1c (Manuscript 1) including the additional potentially overlapping variables included in this sample (Group Identification and Collective Control).*

	Group Power	Collective Efficacy	Group Discrimination	Group Identification	Collective Control	Personal Autonomy Support From Ingroup Members	Personal Regulatory Style
Collective Autonomy	.07(.27)	.08(.26)	.07(.27)	.08(.29)	.09(.30)	.07(.26)	.08(.28)
Potentially Overlapping Variable	.00(.07)	.04(.19)	.00(.00)	.01(.12)	.01(.10)	.05(.23)	.07(.27)

Table S8: *Squared semi-partial correlations examining the unique relation between collective autonomy and personal autonomy, and each potentially overlapping variable and personal autonomy, when accounting for the other variable (Sample 1c). Each column pertains to a separate analysis including collective autonomy and the potentially overlapping factor listed at the top of the column. The non-squared semi-partial correlations are listed in parentheses.*

		β	*95% CI (Lower Limit)*	*95% CI (Upper Limit)*
Model 1.				
	Group Power	.05	-.06	.14
	Collective Efficacy	.11	-.02	.28
	Group Discrimination	-.10	-.15	.00
	Group Identification	-.10	-.24	.03
	Collective Control	.04	-.07	.16
	Personal Autonomy Support	.17	.05	.35
	Personal Regulatory Style	.22	.10	.33
Model 2.				
	Group Power	.00	-.10	.10
	Collective Efficacy	.10	-.03	.27
	Group Discrimination	.00	-.08	.08
	Group Identification	-.09	-.23	.04
	Collective Control	.02	-.09	.14
	Personal Autonomy Support	.16	.04	.33
	Personal Regulatory Style	.20	.09	.31
	Collective Autonomy	.23	.10	.30

Table S9: *Hierarchal linear regression examining the unique effect of collective autonomy on personal autonomy when simultaneously accounting for all potentially overlapping variables that were measured in the Sample 1c (Manuscript 1). The potentially overlapping variables were entered into the first step of the model. Collective autonomy was entered into the second step of the model. Beta represents the standardized beta coefficients. Significant beta coefficients are indicted when the 95% confidence interval does not contain 0. Accounting for all potentially overlapping variables, collective autonomy accounted for 4 percent of the variance in personal autonomy,* $R^2_{change}=.04$, $F_{chage}(1,359)=15.64$, $p < .001$.

Supplemental Analyses 2: Testing the potential moderating effect of group identification on the relation between collective autonomy and personal autonomy (Study1, Manuscript 1)

We examined whether group identification might moderate the impact of collective autonomy on personal autonomy. There was no significant interaction between collective autonomy and group identification on personal autonomy in Sample 1A (*B*=.09, *SE*=.08, 95% CI=[-.07, .25], *p*=.28), Sample 1B (*B*=-.02, *SE*=.13, 95% CI=[-.27, .23], *p*=.85), or Sample 1C (*B*=.07, *SE*=.05, 95% CI=[-.02, .16], *p*=.14).

Supplemental Analyses 3: Testing the indirect effect of collective autonomy on psychological wellbeing (Study 1, Manuscript 1)

In Study 1, we conducted initial exploratory analyses to test if collective autonomy was indirectly related to group members' psychological wellbeing through personal autonomy. Psychological wellbeing was assessed using a composite score of: *Diener's life satisfaction scale* (Diener, Emmons, Larsen, & Griffin, 1985; Sample 1a α=.90; Sample 1b α=.92; Sample 1c α=.90); *the short index of self-actualization* (Jones & Crandall, 1986; Sample 1a α=.62; Sample 1b α=.68; Sample 1c α=.68); *Rosenberg's self-esteem scale* (Rosenberg, 1965; Sample 1a α=.88; Sample 1b α=.89, Sample 1c α=.88); and *the Centre for Epidemiological Studies Depression Inventory* (Radloff, 1977; Sample 1a α=.81; Sample 1b α=.83; Sample 1c α=.84). An overall score of psychological wellbeing was computed by taking the mean of the standardized scores of each individual measure (Sample 1a α=.74; Sample 1b α=.78; Sample 1c α=.75). Mediation analyses conducted with PROCESS (Model 4; 5,000 boot-strapping samples) found significant indirect effects of collective autonomy on psychological wellbeing through personal autonomy for each sample. The total effect of collective autonomy on wellbeing was significant for each sub-sample, however, supporting mediation, the direct effect of collective autonomy on wellbeing was non significant when accounting for personal autonomy was non-significant. Results are summarized in Table S10. We repeated these analyses controlling for all potentially overlapping variables included in each sub-sample: group power (all samples), group identification (all samples), group distinctiveness (Sample 1a & Sample 1b), personal autonomy support (Sample 1b & Sample 1c), and personal regulatory style (Sample 1b & Sample 1c), collective efficacy (sample 1c), collective control (sample 1c) and discrimination (Sample 1c). For each sub-sample, the indirect effect remained significant when controlling for these additional potentially overlapping variables (Table S11).

	Total Effect	Direct Effect	Indirect Effect
Sample 1a	Total effect = .20, *SE*=.07, 95% *CI* = [.07, .33]	Direct effect = .05, *SE*=.07, 95% *CI* = [-.08, .18]	Indirect effect = .15, *SE*=.05, 95% *CI* = [.06, .27]
Sample 1b	Total effect = .17, *SE*=.07, 95% *CI* = [.04, .31]	Direct effect = .02, *SE*=.06, 95% *CI* = [-.10, .14]	Direct effect = .15, *SE*=.05, 95% *CI* = [.07, .25]
Sample 1c	Total effect = .09, *SE*=.03, 95% *CI* = [.02, .15]	Direct effect = .00, *SE*=.03, 95% *CI* = [-.06, .06]	Indirect effect = .09, *SE*=.02, 95% *CI* = [.06, .13]

Table S10*: Mediation analyses testing the indirect effect of collective autonomy on personal psychological wellbeing via personal autonomy for each of the three sub-samples of Study 1 (Manuscript 1).*

	Total Effect	Direct Effect	Indirect Effect
Sample 1a	Total effect = .16, *SE*=.08, 95% *CI* = [.01, .31]	Direct effect = .03, *SE*=.08, 95% *CI* = [-.12, .18]	Indirect effect = .13, *SE*=.06, 95% *CI* = [.05, .27]
Sample 1b	Total effect = .13, *SE*=.07, 95% *CI* = [-.01, .27]	Direct effect = .04, *SE*=.06, 95% *CI* = [-.08, .16]	Direct effect = .09, *SE*=.04, 95% *CI* = [.02, .19]
Sample 1c	Total effect = .02, *SE*=.04, 95% *CI* = [-.05, .09]	Direct effect = -.03, *SE*=.03, 95% *CI* = [-.10, .04]	Indirect effect = .05, *SE*=.02, 95% *CI* = [.02, .08]

Table S11: *Mediation analyses for each sub-sample in Study 1 (Manuscript 1) testing the indirect effect of collective autonomy on personal psychological wellbeing via personal autonomy while controlling for the primary potentially overlapping variables described in the main-text and the additional potentially overlapping variables described in supplemental analyses.*

Supplemental Analyses 4: Replication with alternative collective autonomy scale (Study 1, Manuscript 1)

The collective autonomy scale utilized in the present research was phrased such that all items assessing group members' perceived freedom to practice and determine one's culture were positively scored (e.g., We have been free to determine our identity). In contrast, all the items assessing feeling controlled and restricted by outgroups were negatively scored (e.g., Other groups have tried to control what customs and practices we should follow). We intentionally phrased the scale in this manner, as we reasoned that it would be most intuitive for participants to rate the extent to which they felt free or controlled, rather than to have participants rate the extent to which they *did not* feel free to practice their culture or *did not* feel controlled by other groups.

However, with Sample 1c of Study 1, we wanted to ensure that our results would not change if we assessed collective autonomy with a scale that also contained negatively scored items assessing group members' freedom to practice and determine their culture (e.g., We have NOT always felt free to determine our own cultural identity: our customs, practices, values, beliefs, and traditions) and positively scored items assessing group members' perception that other group's controlled their group (e.g., In general, other groups have NOT tried to prevent us from behaving in ways that reflect our cultural values and shared beliefs). Thus, with sample 1C, in addition to including our primary16-item scale, we also included an alternative 18-item collective autonomy scale that utilized positively scored and negatively scored items to assess perceptions of feeling free to practice one's culture and perceptions of feeling controlled by other groups.

We first tested whether the alternative scale would have the same three-factor structure as our primary collective autonomy scale that we report in the main text. Thus, we performed confirmatory Factor Analysis (CFA) using Lavaan in which we tested the fit of a three factor model in which 8 items represented group members' perception that they were free to practice and define their culture, 7 items represented group members' perception that they were controlled by members of other groups, and 3 items represented group members' perception that their collective autonomy was supported by other groups. Consistent with the results found with the original scale, CFA utilizing the alternative scale items found that our three factor model had an acceptable fit for the data, *CFI*=.91, *SRMR*=.07, *RMSEA*=.097 (Byrne, 1994; Steiger, 1990). Furthermore, there were no negative error variances or improper solutions within the model. Furthermore, the reliability of the alternative scale was also high (α=.95).

In Table S12 we list all items used in the alternative scale and report the corrected inter-item correlation for each item. In Table S13 we provide a correlation table comparing the correlations between the two collective autonomy scales, personal autonomy, and all of the potentially overlapping variables included in Study 1c. As expected, both collective autonomy scales were very highly inter-correlated, and had correlations of similar magnitude with the other variables included in the study. Finally, we also repeated the hierarchal linear regression analyses with the alternative scale (controlling for all potentially overlapping variables included in the study). Consistent with our results yielded with the primary scale, collective autonomy as measured with the alternative scale accounted for a significant portion of the variance in personal autonomy, when accounting for the other potentially overlapping variables included in the study, R^2_{change}=.03, p <.001.

	IICs
1. We have always felt free to determine who we are as a people.	.75
2. We have always felt free to determine our own cultural identity: our customs, practices, values, beliefs and traditions.	.73
3. We have NOT always felt free to determine our own cultural identity: our customs, practices, values, beliefs, and traditions	.72
4. We have NOT always felt free to determine who we are as a people.	.69
5. We have always felt free to behave in ways that reflect our cultural values and shared beliefs openly in society.	.73
6. We have always felt free to practice our cultural customs and traditions openly in society.	.67
7. We have NOT always felt free to behave in ways that reflect our cultural values and shared beliefs openly in society.	.70
8. We have NOT always felt free to practice our cultural customs and traditions openly in society.	.69
9. In general, other groups have always tried to control us.	.69
10. In general, other groups have always tried to control what we should value and believe.	.76
11. In general, other groups have always tried to control what customs and practices we should follow.	.73
12. In general, other groups have always tried to prevent us from practicing our cultural customs and traditions openly in society.	.73
13. In general, other groups have always tried to prevent us from behaving in ways that reflect our cultural values and shared beliefs.	.75
14. In general, other groups have always respected our freedom.	.61
15. In general, other groups have always respected our freedom to determine our own beliefs and values.	.62
16. In general, other groups have always respected our freedom to determine our own cultural customs and practices.	.68
17. In general, other groups have NOT tried to prevent us from practicing our cultural customs and traditions openly in society.	.69
18. In general, other groups have NOT tried to prevent us from behaving in ways that reflect our cultural values and shared beliefs.	.72

Table S12: *Alternative collective autonomy scale (Sample 1c, Manuscript1)*

	M	*SD*	1	2	3	4	5	6	7	8	9	10
1.Collective Autonomy (Original Scale)	4.65	1.21		.93***	.31***	.35***	.26***	-.52***	.16**	.13*	.21***	.15***
2.Collective Autonomy (Alternative Scale)	4.73	1.25			.30***	.38***	.26***	-.50***	.18***	.15**	.24***	.19***
3.Personal Autonomy	4.92	1.03				.17***	.25***	-.16**	.17***	.13*	.28***	.30***
4.Group Power	5.58	1.26					.55***	-.24**	.42**	-.06	.36**	.10
5.Collective Efficacy	5.98	.88						-.16**	.53*	.10	.50**	.29***
6.Group Discrimination	4.17	1.38							-.08	-.10*	-.13*	-.08
7.Group Identification	6.07	1.01								-.01	.61**	.34***
8.Collective Control	4.44	.93									.01	.34***
9.Personal Regulatory Style	5.39	.90										.39***
10.Personal Autonomy Support	4.96	1.04										

*p<.05, **p<.01, ***p<.001

Table S13: *Correlations between the collective autonomy scale used in primary analyses, and the alternative scale also included in Sample 1c (Manuscript 1). Both scales were highly correlated (r=. 93), and there were no differences in terms of how the two scales related to personal autonomy, or the other potentially overlapping variables assessed in the study.*

Supplemental Analyses 5: Corrected item-total correlation coefficients of the collective autonomy scale (Study 1, Manuscript 1)

	Sample 1a	Sample 1b	Sample 1c	Combined Sample
C1. Other groups have tried to control us (*rev. scored*).	.68	.73	.77	.73
C2. Other groups have tried to control what we can do (*rev. scored*).	.66	.72	.79	.74
C3. Other groups have tried to control what we should value and believe (*rev. scored*).	.71	.72	.71	.70
C4. Other groups have tried to control what customs and practices we should follow (*rev. scored*).	.67	.72	.74	.71
C5. In general, other groups try to control the extent to which we can act in accordance with our cultural identity (*rev. scored*).	.70	.61	.78	.73
C6. In general, other groups try to control the extent to which we can follow our customs and practices (*rev. scored*).	.61	.67	.77	.70
C7. In general, other groups try to control the extent to which we can act in accordance with our cultural values (*rev. scored*).	.71	.61	.63	.73
C8. Other groups impose aspects of their culture onto our culture (*rev. scored*).	.60	.47	.79	.59
C9. We have been free to determine our identity.	.63	.50	.65	.62
C10. We have been free to determine our customs and practices.	.73	.57	.64	.64
C11. We have been free to determine our core values and shared beliefs.	.57	.45	.64	.59
C12. We have been free to determine who we are as a people.	.58	.44	.62	.58
C13. We have been free to determine what we do as a people.	.62	.50	.67	.63
C14. In general, other groups support the right that we have to act in accordance with our identity.	.55	.47	.65	.59
C15. In general, other groups support the right that we have to follow our customs and practices.	.54	.61	.61	.59
C16. In general, other groups support the right that we have to act in accordance with what we value.	.44	.48	.65	.57

Table S14: *Corrected item-total correlation coefficients of the collective autonomy scale used in Study 1 (Manuscript 1) across all three samples and the total sample.*

Supplemental Analyses 6: Repeating the analyses of Study 2 (Manuscript 1) when subdividing the sample by the year in which the study was conducted.

Data collection for Study 2 (Manuscript 1) was conducted over the period of two years. Two hundred and nineteen participants were recruited in year one. After excluding participants with missing data, 213 participants remained (50 groups; collective autonomy threat, N= 73, 16 groups; collective autonomy support, N= 64, 16 groups; control condition, N=76, 18 groups). During the second year 196 participants were recruited. Twenty participants were excluded because of missing data. Thus, 176 participants (45 groups) remained in the year two sample (collective autonomy threat, N= 58, 15 groups; collective autonomy support, N= 56, 14 groups; control condition, N=62, 16 groups).

To gain further confidence in our results, we repeated our primary analyses when sub-dividing our sample on the basis of which year participants took part in the study. The effect sizes and pattern of results when sub-dividing the data on the basis of the year for both sub-samples are consistent with what we find with the total sample, and support for our primary hypotheses (See Table S15). However, because of limited statistical power due to reduced sample sizes we recommend interpreting the results of the individual sub-samples with caution.

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

Outcome	Sample	Power	Model Fit (vs. Null Model)	Threat vs. Control	Threat vs. Support	Control vs. Support
Collective Autonomy						
	Year 1	1.00	χ^2 =101.68, p <.001, $R^2_{level\_change}$=.54	γ=2.16, *95% CI*=[1.89, 2.43], t(210)=15.58, p <.001	γ=1.96, *95% CI*=[1.67, 2.24], t(210)=13.51, p <.001	γ = -.20, *95% CI*=[-.48, .08],t(210)= -1.42, p=.16
	Year 2	1.00	χ^2 =69.06, p <.001, $R^2_{level\_change}$=.44	γ=1.77, *95% CI*=[1.45, 2.09], t(39.84)=10.75, p < .001	γ=1.92, *95% CI*=[1.60, 2.25], t(37.92)=11.33, p < .001	γ=.15, *95% CI*=[-.29, .44], t(38.11)=0.87, p =.39
	Combined Sample	1.00	χ^2 =166.10, p <.001, $R^2_{level\_change}$=.51	γ=1.99, 95% CI=[1.78, 2.20], t(386)=18.82, p <.001	γ=1.94, 95% CI=[1.73, 2.16], t(386)=17.74, p <.001	γ=-.05, 95% CI=[-.26, .17], t(386)=-0.43, p =.67
Satisfaction with In-Game Avatar						
	Year 1	.67, .80	χ^2 =8.67, p=.01, $R^2_{level\_change}$=.11	γ=.38, *95% CI*=[.06, .69], t(210)=2.36, p=.019	γ=.45, *95% CI*=[.13, .77], t(210)=2.71, p =.01	γ = .08, *95% CI*=[-.25, .40], t(210)=.46, p=.65
	Year 2	.60, .83	χ^2 =8.70, p=.01 $R^2_{level\_change}$=.001	γ=.43,*95% CI*=[.05, .80],t(40.54)=2.18, p=.04	γ=.58, *95% CI*=[.19, .97],t(39.09)=2.87, p=.01	γ=.15, *95% CI*=[-.23, .53], t(39.14)=0.77, p =.45
	Combined Sample	.92, .98	χ^2 =17.43, p <.001 $R^2_{level\_change}$=.10	γ=.40, 95% CI=[.16, .63], t(88.51)=3.26, p<.001	γ=.51, 95% CI=[.27, .78], t(88.65)=4.06, p <.001	γ=.11, 95% CI=[-.12, .34], t(91.88)=-0.91, p =.36
Personal Autonomy						
	Year 1	.44, .48	χ^2 =4.82, p=.09, $R^2_{level\_change}$=.01	γ=.32, *95% CI*=[00, .65], t(210)=1.95, p=.05	γ=.31, *95% CI*=[-.02, .65], t(210)=1.82, p=.07	γ = -.01, *95% CI*=[-.34, -.33], t(210)= -.05, p=.96
	Year 2	.20, .32	χ^2 =2.75, p=.25, $R^2_{level\_change}$=.02	γ=.22, *95% CI*=[-.14, .58] t(173)=1.21, p=.23	γ=.30, *95% CI*=[-.07, .67] t(173)=1.58, p=.12	γ=.07, *95% CI*=[-.29, .44] t(173)=0.41, p =.69
	Combined Sample	.64, .71	χ^2 =7.39, p =.03 $R^2_{level\_change}$=.01	γ=.28, 95% CI=[.04, .52], t(386)=2.27, p=.02	γ=.31, 95% CI=[.06, .56], t(386)=2.43, p=.02	γ=.03, 95% CI=[-.22, .28], t(386)=.24, p =.81

Table S15. *The effect of condition on outcomes by the year during which Study 2 (Manuscript 1) was conducted. Observed (post-hoc) power estimates are provided for the 2 contrasts hypothesized to be significant (i.e., Threat vs. Control and Threat vs. Support).*

Outcome	Effect of Year During Which The Study Was Run	Model Fit (vs. Covariate Model)	Threat vs. Control	Threat vs. Support	Control vs. Support
Satisfaction with In-Game Avatar	γ=.15, *95% CI*=[-.06, .37], *t*(90.76)=1.40 *p*=.17	χ^2 =17.73, *p* <.001, $R^2_{level\_change}$=.10	γ=.40, *95% CI*=[.16, .63], *t*(87.13)=3.82 *p*<.001	γ=.51, *95% CI*=[.27, .75], *t*(87.40)=4.06, *p*<.001	γ =.11, *95% CI*=[-.13, .35], *t*(90.55)= .90, *p*=.37
Personal Autonomy	γ=.02, *95% CI*=[-.19, .22], *t*(387.00)=.15 *p*=.88	χ^2 =7.38, *p*=.03 $R^2_{level\_change}$=.01	γ=.28, *95% CI*=[.04, .52],*t*(385.00)=2.37 *p*=.02	γ=.31, *95% CI*=[.06, .56], *t*(385.00)=2.42, *p*=.02	γ =.03, *95% CI*=[-.22, .27], *t*(385.00)=.24, *p*=.81

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

Table S16: *The effect of condition on the primary outcomes of personal autonomy and satisfaction with one's in-game avatar while controlling for the year during which the study was run (Study 2, Manuscript 1).*

Supplementary Analyses 7: Repeating the analyses of Study 2 (Manuscript 1) controlling for the number of people in participants' unique group

Depending on whether or not all participants who were scheduled to partake in the experiment arrived, the size of our randomly created groups varied between 3 to 5 people. We wanted to ensure that size of group did not significantly impact our outcomes of satisfaction with one's in-game avatar or perceptions of personal autonomy. We found no significant effect of group size on group members' reported satisfaction with their in-game avatar or on their level of personal autonomy during the experiment. Furthermore, the effect of condition on these outcomes remained significant when controlling for group size (see Table S17).

Outcome	Effect of Group Size	Model Fit (vs. Covariate Model)	Threat vs. Control	Threat vs. Support	Control vs. Support
Satisfaction with In-Game Avatar	γ=.07, *95% CI*=[-.09, .23], *t*(102.30)=.82 *p*=.42	χ^2 =18.02, *p* <.001, $R^2_{level1\_change}$=.10	γ=.41, *95% CI*=[.17, .65], *t*(88.29)=3.35 *p*<.001	γ=.52, *95% CI*=[.27, .76], *t*(88.32)=4.08, *p<.001*	γ =.11, *95% CI*=[-.14, .35], *t*(90.12)= .85, *p*=.40
Personal Autonomy	γ=-.10, *95% CI*=[-.25, .06], *t*(387.00)=-1.25 *p*=.21	χ^2 =6.99, *p*=.03 $R^2_{level1\_change}$=.01	γ=.27, *95% CI*=[.02, .51],*t*(385.00)=2.16 *p*=.03	γ=.31, *95% CI*=[.05, .55], *t*(385.00)=2.39, *p*=.02	γ =.04, *95% CI*=[-.21, .28], *t*(385.00)=.30, *p*=.76

Table S17: *The effect of condition on the primary outcomes of personal autonomy and satisfaction with one's in-game avatar while controlling for the size of participants' unique group (Study 2, Manuscript 1). We compared the proposed model to a model only including group size and participants' unique group as predictors. Consistent with the results reported in the main text, condition had a significant effect on personal autonomy and in-game avatar satisfaction while accounting for group size. Group size had no significant effect on these outcomes.*

Supplementary Analyses 8: Repeating the analyses of Study 2 (Manuscript 1) controlling for group members' baseline enjoyment of playing video games in general

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

Outcome	Effect of Baseline Enjoyment Of Video Games	Model Fit (vs. Covariate Model)	Threat vs. Control	Threat vs. Support	Control vs. Support
Satisfaction with In-Game Avatar	γ=.03, *95% CI*=[-.02, .08], *t*(382.60)=1.20 *p*=.23	χ^2 =17.66, *p* <.001, $R^2_{level\_change}$=.11	γ=.40, *95% CI*=[.17, .63], *t*(87.20)=3.32 *p*<.001	γ=.51, *95% CI*=[.26, .75], *t*(87.30)=4.06, *p<.001*	γ =.11, *95% CI*=[-.13, .35], *t*(90.80)= .87, *p*=.39
Personal Autonomy	γ=.16, *95% CI*=[.11, .20], *t*(387.00)=6.73 *p*<.001	χ^2 =8.15, *p*=.02, $R^2_{leve1\_change}$=.01	γ=.29, *95% CI*=[.07, .52],*t*(385.00)=2.53 *p* =.01	γ=.29, *95% CI*=[.05, .52], *t*(385.00)=2.41, *p*=.02	γ =.00, *95% CI*=[-.24, .23], *t*(385.00)=-.03, *p*=.98

Table S18: *The effect of condition on the primary outcomes of personal autonomy and satisfaction with one's in-game avatar while controlling for participants baseline enjoyment of video game (Study 2, Manuscript 1). We grand mean centered participants' baseline enjoyment of video games (Hayes, 2006). We compared the proposed model to a model only including group members' baseline enjoyment of video games. Consistent with the results reported in the main text, condition had a significant effect on personal autonomy and in-game avatar satisfaction while accounting for group members' baseline enjoyment of video games.*

Supplemental Analyses 9: Examining the effects of the collective autonomy threat manipulation on participants' perceptions of group power and autonomy support from other group members (Study 2, Manuscript 1).

In Study 2, we again sought to further differentiate collective autonomy from two important potentially overlapping variables: feelings of group power and perceiving personal autonomy support from members of one's own ingroup. Thus, we assessed these two outcomes at the end of the study and tested whether our collective autonomy manipulation had a significant unique effect on these outcomes. Group power was assessed using 3 items adapted from Shnabel and Nadler's (2008) measure of personal power: e.g., "During the study we felt relatively strong as a group", (α=.60). Autonomy support from other ingroup members was measured with 8 items from Williams and colleagues' (1996) scale of autonomy support: e.g., "The members of my group listened to how I would like to do things", (α = .83). As expected, we found no significant effect of condition on these two potentially overlapping variables (See Table S20).

Outcome	ICC	Model Fit (vs. Null Model)	Threat vs. Control	Threat vs. Support	Control vs. Support
Power	.31	χ^2 =1.45, p =.48 $R^2_{level1\_change}$=.00	γ=.13,t(85.40)=.73 p =.47	γ=.19,t(86.47)=1.17, p .24	γ = .08,t(88.03)= -.479, p=.63
Personal Autonomy Support from Ingroup Members	.09	χ^2 =4.53, p=.10 $R^2_{level1\_change}$=.06	γ=.02,t(88.36)=.27, p < .79	γ=.20,t(89.70)=1.97, p=.05	γ=.18,t(92.50)=0.87, p =.09

Table S19. *The effect of condition on the potentially overlapping variables accounted for in Study 2, Manuscript 1 (Group Power and Personal Autonomy Support from other group members). Providing further specificity for our results, we found no significant improvement in model fit when adding the effect of condition (relative to the null model) to predict power or personal autonomy support from other ingroup members.*

Supplemental Analyses 10: Repeating the key analyses of Study 3 (Manuscript 1) when including participants asked to describe their core cultural group in general

Beyond the two primary conditions focused on in the main text (i.e., the collective autonomy threat condition and the collective autonomy support condition) we also included a condition in which participants were asked to describe the customs and practices of their core cultural group in general, which we refer to as the "neutral" condition. We repeated our main-text analyses this time including participants from all three conditions (See Table S20 and Table S21). Participants in the neutral condition reported significantly lower levels of collective autonomy relative to participants assigned to the collective autonomy support condition, yet did not differ in their perceptions of collective autonomy relative to those assigned to the collective autonomy threat condition. Participants in the neutral condition also did not differ significantly from those assigned to the two other conditions with respect to personal autonomy or psychological wellbeing. Importantly however, our key contrast comparing those in the collective autonomy threat condition to those in the collective autonomy support condition were consistent with out main text analyses: describing an intergroup event during which one's ingroup lacked rather than had collective autonomy lead to significant reductions in personal autonomy, and in turn, significantly lower psychological wellbeing.

	F Statistic	Threat vs. Neutral (*Mean Difference*)	Threat vs. Support (*Mean Difference*)	Neutral vs. Support (*Mean Difference*)
Collective Autonomy	$F(2,527)=10.46$, $p<.001$, $\eta^2=.04$	*MD*=-.17, $p=.31$, *95%CI*=[-.42,.09]	*MD*=-.53, $p<.001$, *95%CI*=[-.82,-.24]	*MD*=-.36, $p<.001$, *95%CI*=[-.61,-.12]
Personal Autonomy	$F(2,527)=2.17$, $p=.12$, $\eta^2=.01$	*MD*=-.18, $p=.13$, *95%CI*=[-.41,.05]	*MD*=-.27 $p=.04$, *95%CI*=[-.53,-.01]	MD=-.09, $p=.41$, *95%CI*=[-.32,.13]
Psychological Wellbeing	$F(2,527)=1.79$ $p=.17$, $\eta^2=.01$	MD=-.02, $p=.84$, *95%CI*=[-.15,.18]	MD=-.13 $p=.16$, *95%CI*=[-.32,.05]	MD=-.15, $p=.08$, *95%CI*=[-.31,.01]

Table S20: *Repeating the analyses of Study 3, Manuscript 1, when including participants who were randomly assigned to describe their core cultural group in general (which we refer to as the neutral condition). Consistent with the main-text analyses, we found that describing an instance of collective autonomy threat relative to an instance of collective autonomy support significantly reduced group members' personal autonomy.*

	Total Effect	Direct Effect	Indirect Effect
Collective Autonomy Threat vs. Neutral	Total effect = -.02, *SE*=.08, 95% *CI* = [-.18, .15]	Direct effect = -.08, *SE*=.07, 95% *CI* = [-.23, .06]	Indirect effect = .03, *SE*=.06, 95% *CI* = [-.03, .15]
Collective Autonomy Threat vs. Collective Autonomy Support	Total effect =.13, *SE*=.10, 95% *CI* = [-.05, .32]	Direct effect = .03, *SE*=.08, 95% *CI* = [-.13, .20]	Direct effect = .10, *SE*=.05, 95% *CI* = [.001, .19]
Neutral vs. Collective Autonomy Support	Total effect =.15, *SE*=.08, 95% *CI* = [-.01, .31]	Direct effect =.12, *SE*=.07, 95% *CI* = [-.02, .26]	Indirect effect = .03, *SE*=.04, 95% *CI* = [-.04, .11]

Table S21*: Mediation analyses (PROCESS, Model 4, 5,000 boot-strapping confidence intervals) testing the indirect effect of condition on personal psychological wellbeing via personal autonomy when including participants assigned to describe their core cultural group in general (Study 3, Manuscript 1). We provide indirect effects for the three possible contrasts: collective autonomy threat (dummy coded 0,0) vs. neutral (dummy coded 0,1); collective autonomy threat (0,0) vs. collective autonomy support (0,1); and neutral (0,0) vs. collective autonomy support (0,1). Consistent with our main-text analyses, describing an instance of collective autonomy threat relative to an instance of collective autonomy support had a significant indirect effect on group members' psychological wellbeing.*

Supplemental Analyses 11 – Examining the effects of the collective autonomy threat manipulation on group power, perceived discrimination, personal regulatory style, and perceived autonomy support from group members (Study 3, Manuscript 1)

In Study 3, we again sought to further differentiate collective autonomy from four important potentially overlapping variables: feelings of group power (α=.92), perceived discrimination (α=.70), personal regulatory style (α=.78), and personal autonomy support from other group members (α=.90). Thus, we assessed these outcomes at the end of the study and tested whether our collective autonomy manipulation had a significant unique effect on these outcomes. We expected that our collective autonomy manipulation would *not* have a significant unique impact on these outcomes beyond its impact on collective autonomy, as its effect would be unique to collective autonomy. Supporting this prediction, we did not find significant effects of condition on group power, personal regulatory style, or perceived personal autonomy support from other members within one's ingroup (See Table S22). We did find a significant effect of condition on group members' perceptions of discrimination from other groups, however this effect was not significant when controlling for participants' perceptions of collective autonomy. Furthermore, mediation analysis with PROCESS revealed a significant indirect effect of condition on perceived discrimination via group members' perceptions of collective autonomy (Indirect effect = -.31, *SE*=.08, *95% CI* = [-.50, -.17]). Thus, it appears that the effect of the collective autonomy manipulation on participants' increased perception of discrimination was a result of the collective autonomy threat induced by the manipulation. Taken together, these analyses indicate that our manipulation of collective autonomy did not have any unique effect on the potentially overlapping variables accounted for in Study 3 when accounting for its impact on perceived collective autonomy.

	ANOVA Results	ANCOVA Results (controlling for collective autonomy)
Group Power	$F(2,270)=.59$, $p=.44$,$\eta^2=.002$	$F(2,270)=.10$, $p=.75$,$\eta^2=.00$
Personal Autonomy Support from Ingroup Members	$F(2,270)=.00$, $p=.97$,$\eta^2=.00$	$F(2,269)=.16$, $p=.69$,$\eta^2=.001$
Personal Regulatory Style	$F(2,271)=.89$, $p=.35$,$\eta^2=.003$	$F(2,270)=.08$, $p=.78$,$\eta^2=.00$
Perceived Discrimination	$F(2, 271)=7.47$, $p=.01$,$\eta^2=.03$	$F(2, 271)=1.08$, $p=.30$,$\eta^2=.004$

Table S22. *The effect of condition on the potentially overlapping variables accounted for in Study 3, Manuscript 1 (Group Power and Personal Autonomy Support from other group members, personal regulatory style and discrimination).*

APPENDIX B: Supplemental Materials of All Scales and Experimental Materials Used in Manuscript 1

Study 1, Manuscript 1: Questionnaire Materials

Core Cultural Identification and Intergroup Context Identification Task (Used in all 3 sub-samples)

What cultural group do you identify with most?

Instructions: People identify to differing degrees with different social groups. One type of social group that we belong to is a core cultural group. This is the group you refer to naturally when people ask you what your background is, and you reply "I am x". Some people may identify with broad national groups, and respond to such questions by saying "I am Canadian" or "I am Indian". Others may identify with more specific groups, such as a religious or ethnic subgroup within a broader national group and may reply in ways more like these examples: "I am a Jewish-Canadian", "I am a Canadian Jew", "I am Indo-Canadian", or "I am Quebecois". For this questionnaire we will ask you questions about your core cultural group- the cultural group you identify with most. This can be the culture of your birth, the culture in which you were raised, or another culture that forms part of your background. For some this will be easy, however for many we know that determining what your core culture can be hard to do, as you may feel that you identify with more than one culture, or no culture at all. Nevertheless, please do your best to pick the culture that you identify most strongly with, and the culture that you feel most "makes you who you are". Feel free to respond to this as naturally as you can. In the text box below the circle, write down the cultural group that you identify with the most (e.g. "Jews." "Koreans." "the Irish." "Asians." "New Yorkers." "Chinese-American.")

WE are:

What context do you see your core cultural group ({{WEare}}) In?

The social contexts that affect our cultural groups are complex and there are many of them. Different contexts will matter to different people. For example, someone who identifies with the

culture in which they were born may think primarily of that immediate cultural milieu. Another person who has immigrated from his/her homeland to live in the United States may frequently think about members of his/her culture back home in their country of origin. Another person who has immigrated from his/her homeland to the United States may think more frequently about other members of his/her culture who are also living in the United States. For other cultural groups that have experienced Diaspora you may see your group as being spread in different locations across the globe. When you answer this survey, we want you to think about your cultural group ({{ WEare }}) in the context that matters the most to you.To help you do so, here is a world map. Which geographic area do you most strongly associate with your core cultural group ({{ WEare }})? Please look at the world map to locate this area, then write down the name of this area below the map. This could be a country, a state, a province, a city, or even a community within a city. If more than one space comes to mind, feel free to write all of them in the space.

Type the name of the area(s):

What other cultural group interacts with your group the most?

In this survey, we will ask you questions about how the members of your core cultural group have interacted with other cultural groups and how your core cultural group is compared to other cultural groups. Of course the world is filled with many cultures, but we want to know about the other group that has interacted with your group ({{WEare}}) the most and has influenced your group the most. For example, an Indian may think of Pakistani people, or the British. An

immigrant living in Canada may think of mainstream Canadians. To help you conceptualize this more clearly, we would like you to fill in the shapes below. In the text box below the circle, we would like you to write the name of your core cultural group again ("Who we are"). In the text box below the rectangle, we would like you to write the name of the other cultural group that has interacted with your cultural group the most ("Who they are"). (e.g. "Jews." "Koreans." "the Irish." "Asians." "New Yorkers." "Chinese-American.")

Context Specific Power (Included in Sample 1b and Sample 1c)

What are the power dynamics between the two group PRESENTLY?

We want to know what the PRESENT power dynamic is between your group and the other group? Slide the cursor towards the group who PRESENTLY has the most power. The closer the cursor is to a group's name, the more power this group has. If both groups have equal power, leave the cursor at 0 (in the center of the slider).

Ideal Power Dynamics (Included in Sample 1c only)

What would you want the power dynamics be between your group and the other group?
We want to know what YOU WOULD LIKE the power dynamic to be between your group and the other group. The closer the cursor is to a group's name, the more power this group would have. If you would want both groups to have EQUAL power, leave the cursor at 0 (in the center of the slider).

Context Specific Collective Autonomy (Included in Sample 1c only)

Does the other group try to control your group?
We want to know the extent to which the other group has tried to control your group? Do they try to unduly influence your group's culture - your customs, practices, values and traditions? Do they try to prevent members in your group from practicing your culture?Use the cursor to rate how much the other group has tried to control you, from 0 to 100, where "0" = "**not at all", and "100" = "very much so"**

Quality of Relations (Included in Sample 1b and 1c only)
We want to know whether or not the relations between members of your group and the other group are positive or negative? Place the cursor closer to "positive" or "negative" depending on the degree to which your group and the other group get along well. Leaving the cursor to 0 means that the quality of relations is neutral.

What context do you see the other group ({{THEYare}}) In? (Included in Sample 1a and Sample 1b Only)
We would now like you to think about where you see the group that interacts with your group the most ({{THEYare}}).To help you do so, here is a world map. Which geographic area do you most strongly associate with the other group ({{ THEYare }})? Please look at the world map to locate this area, then write down the name of this area below the map. This could be a country, a state, a province, a city, or even a community within a city. If more than one space comes to mind, feel free to write all of them in the space.

Type the name of the area(s):

Variables Reported in Text

Collective Autonomy Scale (Included in all three sub-samples)
While answering this section, please keep in mind the people within your most identified-with cultural group, {{WEare}}, in general. Following are statements about the extent to which your group is free from the influence and control of other groups in determining its identity, with which you may disagree or agree. Please use the following 7-point scale to indicate the extent to which you agree with each of these statements. Use the following seven-point scale to indicate the extent to which you agree with each statement. There are no right or wrong answers.

1. We (*name of core cultural group*) have been free to determine our identity.
2. We () have been free to determine our customs and practices.
3. We () have been free to determine our core values and shared beliefs.
4. We () have been free to determine who we are as a people.
5. We () have been free to determine what we do as a people.
6. Other groups have tried to control us ().
7. Other groups have tried to control what we () can do.
8. Other groups have tried to control what we () should value and believe.
9. Other groups have tried to control what customs and practices we () should follow.
10. In general, other groups support the right that we () have to act in accordance with our identity.
11. In general, other groups support the right that we () have to follow our customs and practices.
12. In general, other groups support the right that we () have to act in accordance with what we value.
13. In general, other groups try to control the extent to which we () can act in accordance with our cultural identity.
14. In general, other groups try to control the extent to which we () can follow our customs and practices.
15. In general, other groups try to control the extent to which we () can act in accordance with our cultural values.
16. Other groups impose aspects of their culture onto our culture ().

Personal Autonomy (Included in all 3 samples)
Please rate your agreement with the following statements, bearing in mind your feelings DURING THE LAST WEEK. Please use the 7-point scale to indicate the extent to which you agree with each of these statements.

1. I was free to do things my own way.
2. I had a lot of pressures I could do without.
3. My choices expressed my "true self."
4. There were people telling me what I had to do.
5. I had to do things against my will.
6. I was really doing what interests me.
7. For this question, do not select any response.

Potentially Overlapping Variables Focused On in the Main Text

Feeling of Group Power (Adapted from Shnabel & Nadler, 2008 - included in all sub samples)
We would like you to answer some questions about the core cultural group that you identified previously ({{WEare}}). There are no right or wrong answers. Please use the 7-point scale to indicate the extent to which you agree with each of these statements.

1. My core cultural group () feels relatively strong as a group.
2. My core cultural group () has a lot of influence as a group.
3. My core cultural group () has a lot of control as a group.
4. My core cultural group () has a lot of power as a group.

Collective Efficacy (adapted from Gibson, Randel, & Earley, 2000 - included in Sample 1c)
Please rate your agreement to the following statements concerning your core cultural group {{WEare}}. There are no right or wrong answers.

1. Members of my core cultural group () can do anything they really set their minds to.
2. Members of my core cultural group () know what is involved for practicing their cultural customs and traditions.
3. Members of my core cultural group () have confidence in their ability to speak their own language.
4. My core cultural group () can overcome any problem it faces.
5. MY core cultural group () has accomplished a lot.

Discrimination (Included in sample 1c)
Please rate your agreement to the following statements concerning your core cultural group {{WEare}}. There are no right or wrong answers.

1. It is common that members from other groups discriminate against members of my group.
2. My core cultural group has been the target of prejudice.
3. It is rare that members of my core cultural group face discrimination.

Personal Regulatory Style for Practicing Culture (adapted from Chirkov et al., 2003 – included in sample 1B and sample 1C).

We would now like to know why you might choose to follow and endorse the different VALUES that you feel come from your core cultural group ({{WEare}}). Please rate your agreement with each of the statements below concerning the different reasons that we might choose to endorse the values of your cultural group.

1. Because of external pressures (to get rewards or avoid punishments). I follow the values of my core cultural group () either because people insist on me doing so, I expect to get some kind of reward, or in order to avoid some punishment.
2. To get approval or avoid guilt. I follow the values of my core cultural group () either because people around me would approve of me for doing so, because I think I should, or because if I didn't I might feel guilty, ashamed, or anxious.
3. Because it is important. I follow the values of my core cultural group () because I personally believe that it is important and worthwhile to behave this way.
4. Because I have thoughtfully considered and fully chosen to do so. I have thought about these values of my core cultural group () and have considered alternatives. It makes good sense to me to act this way, I feel free in doing so, and I feel responsible for the outcomes.

We would now like to know why you might choose to follow and endorse the different CUSTOMS and PRACTICES that you feel come from your core cultural group ({{WEare}}). Please rate your agreement with each of the statements below concerning the different reasons that we might choose to endorse the values of your cultural group.

5. Because of external pressures (to get rewards or avoid punishments). I follow the values of my core cultural group () either because people insist on me doing so, I expect to get some kind of reward, or in order to avoid some punishment.
6. To get approval or avoid guilt. I follow the values of my core cultural group () either

because people around me would approve of me for doing so, because I think I should, or because if I didn't I might feel guilty, ashamed, or anxious.

7. Because it is important. I follow the values of my core cultural group () because I personally believe that it is important and worthwhile to behave this way.
8. Because I have thoughtfully considered and fully chosen to do so. I have thought about these values of my core cultural group () and have considered alternatives. It makes good sense to me to act this way, I feel free in doing so, and I feel responsible for the outcomes.

Personal Autonomy Support from Ingroup Members (adapted from Williams et al., 1996 – Included in Sample 1b and Sample 1c)

This questionnaire contains items that are related to how you feel you are treated by important people (e.g. doctor, teacher, parents) within your core cultural group ({{WEare}}) who you interact with on a regular basis. Please use the following 7-point scale to indicate the extent to which you agree with each of these statements.

1. I feel that the people from my core cultural group () whom I interact with on a regular basis provide me with choices and options during our interactions.
2. I feel that the people from my core cultural group () whom I interact with on a regular basis understand me.
3. I feel that the people from my core cultural group () whom I interact with on a regular basis are able to be open with me.
4. I feel that the people from my core cultural group () whom I interact with on a regular basis accept me as a person.
5. When the people from my core cultural group () whom I interact with on a regular basis tell me to do something they make sure that I really understand what they want me to do.
6. When the people from my core cultural group () whom I interact with on a regular basis talk to me they always ask questions.
7. When I ask people from my core cultural group () whom I interact with on a regular basis questions they answer these questions fully and carefully.
8. The people from my core cultural group () whom I interact with on a regular basis listen to how I would like to do things.
9. The people from my core cultural group () whom I interact with on a regular basis handle my emotions very well.
10. I feel that the people from my core cultural group () whom I interact with on a regular basis

care about me.

11. I don't feel very good about the way the people from my core cultural group () whom I interact with on a regular basis talk to me.
12. The people from my core cultural group () whom I interact with on a regular basis take the time to understand how I understand things before suggesting a new way to do things.
13. I feel that I am able to share my feelings with the people from my core cultural group () whom I interact with on a regular basis.

Other Variables Reported in Supplemental Analyses

Group Identification (Included in all samples)**:**
We would like you to answer some questions about the core cultural group that you identified previously ({{WEare}}). There are no right or wrong answers. Please use the 7-point scale to indicate the extent to which you agree with each of these statements.

1. I identify with members of my core cultural group ().
2. I see my self as being a member of my core cultural group ().
3. I feel strong ties to other members of my core cultural group ().
4. I am pleased to be a member of my core cultural group ().

Group Distinctiveness (Included in Sample 1a, and Sample 1b)
While answering this section, please keep in mind your most identified-with {{WEare}} in general. Following are statements with which you may disagree or agree. There are no right or wrong answers. Please use the following 7-point scale to indicate the extent to which you agree with each of these statements.

1. Your cultural group () has a different cultural identity when compared to other groups.
2. Your cultural group () has different cultural customs and practices when compared to other cultural groups.
3. Your cultural group () has different values when compared to other cultural groups.
4. Your cultural group () is unique when compared to other cultural groups.

Collective Control (Tiessen, Taylor, & Kirmayer, 2009 – included in Sample 1c)
Please rate your agreement to the following statements concerning your core cultural group {{WEare}}. There are no right or wrong answers.

1. The good things that happen to people in my core cultural group () are due to their own effort.
2. The good things that happen to people in my core cultural group () are due to outside help.
3. The good things that happen to people in my core cultural group () are due to good luck.
4. The good things that happen to people in my core cultural group () are due to the will of the creator (or some higher power).
5. The bad things that happen to people in my core cultural group () are due to their own mistakes.
6. The bad things that happen to people in my core cultural group () are due to outside interference.
7. The bad things that happen to people in my core cultural group () are due to bad luck.
8. The bad things that happen to people in my core cultural group () are due to the will of the creator (or some higher power).

Measures of Personal Psychological Wellbeing Included for Exploratory Analyses

Life Satisfaction (Diener, Emmons, Larsen, & Griffin, 1985 – Included in all 3 samples)
Below are a number of statements you that you may agree or disagree with. There are no right or wrong answers. Please use the following 7-point scale to indicate the extent of your agreement with each of these statements.

1. In most ways, my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

Self-actualization scale (Jones & Crandall, 1986 – Included in all 3 samples)
Below are statements you that you may agree or disagree with. There are no right or wrong answers. Please use the following 7-point scale to indicate the extent of your agreement with each of these statements.

1. I do not feel ashamed of any of my emotions.
2. I feel I must do what others expect me to do.

3. I believe that people are essentially good and can be trusted.
4. I feel free to be angry with those I love.
5. It is always necessary that others approve of what I do.
6. I don't accept my own weaknesses.
7. I can like people without having to approve of them
8. I fear failure.
9. I avoid attempts to analyze and simplify complex domains.
10. It is better to be yourself than to be popular.
11. I have no mission in life to which I feel especially dedicated.
12. I can express my feelings even when they may result in undesirable consequences.
13. I do not feel responsible to help anybody.
14. I am not bothered by fears of being inadequate.
15. I am loved because I give love.

Self-Esteem (Rosenberg, 1965 – Included in all 3 samples)
Below is a list of statements dealing with your general feelings about yourself. Please rate your level of agreement to each statement.

1. On the whole, I am satisfied with myself.
2. At times, I think I am no good at all.
3. I feel that I have a number of good qualities.
4. I am able to do things as well as most other people.
5. I feel I do not have much to be proud of.
6. I certainly feel useless at times.
7. I feel that I'm a person of worth, at least on an equal plane with others.
8. I wish I could have more respect for myself.
9. All in all, I am inclined to feel that I am a failure.
10. I take a positive attitude toward myself.

Depression Inventory (Radloff, 1977 – Included in all three samples)
Below is a list of the ways you might have felt, have felt or have behaved IN THE PAST WEEK. Please indicate below how often you have felt this way during the past week.

1. I felt that I could not shake off the blues even with help from my family or friends.
2. I felt depressed.
3. I was happy.
4. I was bothered by things that usually don't bother me.
5. I felt sad
6. I had crying spells.

Alternate Version of Collective Autonomy Scale Included for Supplemental Analyses
(Included in Sample 1c)

1. We () have always felt free to determine who we are as a people.
2. We () have always felt free to determine our own cultural identity: our customs, practices, values, beliefs and traditions.
3. We () have NOT always felt free to determine our own cultural identity: our customs, practices, values, beliefs, and traditions.
4. We () have NOT always felt free to determine who we are as a people.
5. We () have always felt free to behave in ways that reflect our cultural values and shared beliefs openly in society.
6. We () have always felt free to practice our cultural customs and traditions openly in society.
7. We () have NOT always felt free to behave in ways that reflect our cultural values and shared beliefs openly in society.
8. We () have NOT always felt free to practice our cultural customs and traditions openly in society.
9. In general, other groups have always tried to control us ().
10. In general, other groups have always tried to control what we () should value and believe.
11. In general, other groups have always tried to control what customs and practices we () should follow.
12. In general, other groups have always tried to prevent us () from practicing our cultural

customs and traditions openly in society.

13. In general, other groups have always tried to prevent us () from behaving in ways that reflect our cultural values and shared beliefs.
14. In general, other groups have always respected our () freedom.
15. In general, other groups have always respected our () freedom to determine our own beliefs and values.
16. In general, other groups have always respected our () freedom to determine our own cultural customs and practices.
17. In general, other groups have NOT tried to prevent us () from practicing our cultural customs and traditions openly in society.
18. In general, other groups have NOT tried to prevent us () from behaving in ways that reflect our cultural values and shared beliefs.

List of additional measures included in Study 1 that are beyond the scope of the present research

- **Desire for Group Power** (Included in Sample 1b and Sample 1c)
- **System Justification** (Kay & Jost, 2003– Included in Sample 1c)
- **Empathic Support from Outgroup Members** (Kachanoff, Caouette, Wohl, & Taylor, In Press; Included in Sample 1b)
- **Collective Esteem** (public dimension; included in sample 1a and sample 1b, Luhtanen and Crocker, 1992)

Study 2, Manuscript 1, Materials

Verbal Manipulations Used When Informing the Ingroup of the Outgroup's Decision for How to Use Its' Power

Control Condition: "*The other group wasn't too sure whether or not they wanted to stay in their room or switch with you. They were divided, but in the end they decided to stay in their room."*

Collective Autonomy Threat Condition: "*The other group weren't too sure whether or not they wanted you to keep your own coat of arms design. They were divided, but in the end they decided to modify your coat of arms."*

Collective Autonomy Support Condition: "*The other group weren't too sure whether or not they wanted you to keep your own coat of arms design. They were divided, but in the end they decided not to make any changes to your coat of arms."*

Written Instructions of Background Information and Study Explanation Used In Year 1

Even among our most ancient civilizations, humans have used images of animals and nature, and the various colors that appear in our natural environment to symbolize their personal, family and tribal identities. This was a common practice among the people of ancient Israel, Greece, Egypt and the Aboriginal peoples of North America.

The utilization of colours and pictures to symbolize group identity was formalized into the practice of *armory* during the eleventh century in Europe. Armory can be defined as the practice of using distinctive figures and colours on weapons and shields as a means of identification. In medieval Europe the *coat of arms* was a symbol of a family's heritage. The coat of arms has since become associated with larger groups. For example, military units, provinces and countries still use them.

The practice of armory follows a set of established rules and laws in which the different symbols, components, and colours that appear on the coat of arms represent the specific values and traits that make up a group's identity. By combining these colours and symbols, people can represent their group's distinctive identity. Armory has even been considered a *science* by some scholars in which "the rules and the laws govern the use, the display, meaning, and knowledge of the pictured signs and emblems appertaining to shield" (Fox-Davies, 1909, p.1).

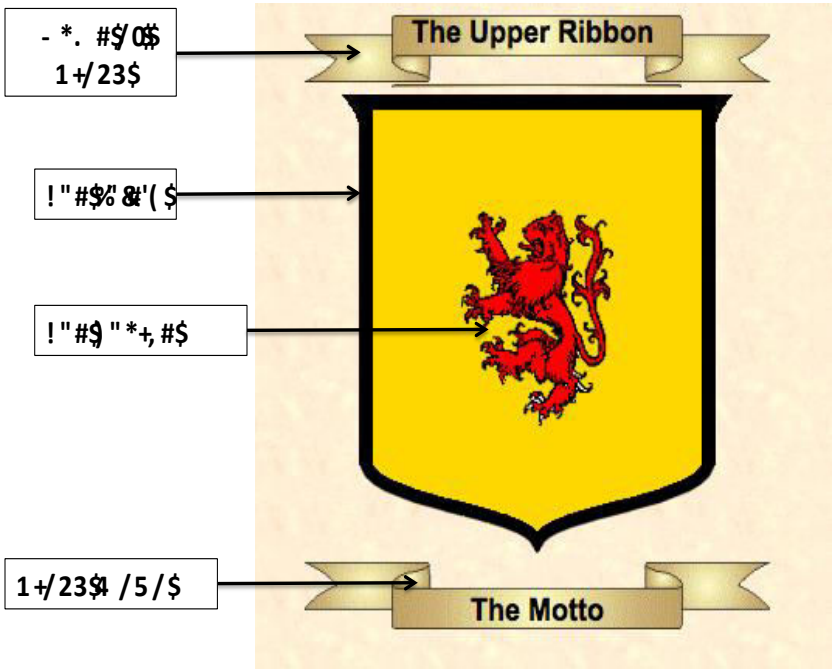
Coat of Arms Components

One of the most important components of the coat of arms is the shield. It is on the shield where the colours and charges that symbolize a group's identity appear. In medieval times, knights would wear their shield on their arm, so that their allies could identify them in battle.

Two important features of the shield are the colour of the shield and the charge that appears on it. They symbolize the values and traits that are most central to the group identity being represented.

Another important feature of the coat of arms is the Motto that appears beneath the shield. The motto is a phrase that states the basic philosophy of the family or group. As well, the coat of arms may contain an Upper Ribbon that displays the name of the group.

Below is a picture illustrating the components of a Coat of Arms:



Today's Study

In today's study you and the other members of you group will play an interactive multiplayer role playing game on the computer called Group Quest. The objective of the game is for your group to complete as many group quests as fast as you can! However, before you begin you will first discuss as a group what it means to be part of your group. In other words, you will

develop an identity for your group. Forming a group identity is essential to being able to perform well as a group. This involves determining what you and your group members value collectively, and the distinct characteristics, traits and practices that you all share. These are the unique attributes that make you a meaningful group. To do this, you will create your own coat of arms that represents your own distinct group identity.

As you create your group identity, think wisely about what values and traits you all share together as a group. Depending on the values and attributes that you and your group define as being characteristic of your group identity, the unit which you will control in Group Quest will have different abilities and special characteristics. In other words, your group coat of arms will have a direct impact on how you will play the Group Quest game! While all combinations of charges and colours will provide a different experience in the game, the overall advantage of any combination is the same!

Creating Your Group Coat of Arms

You and your group members will use the interactive coat of arms program to create a coat of arms for your group. This involves determining the 5 key components of your coat of arms.

1) Shield Color - This symbolizes the values of your group.

2) Group Charge- This symbolizes the common traits that you share with the other members of your group.

3) Charge Color- This also symbolizes the values of your group.

4) Group Name - This is what your group will be known as.

5) Group Motto - The basic philosophy of one's group identity

Instructions for Using the Coat of Arms Generator

1. Select a shield colour, charge, and charge colour for your coat of arms.
2. Click "Generate Coat of Arms Preview" to see a preview of your group's coat of arms.
3. When you have finished creating your group coat of arms you can select the "Finalize Coat of Arms" button to finalize your group coat of arms.
4. Let the experimenter know that you are finished so that he/she can print out your group's coat of arms!

Video Instructions of Background Information and Study Explanation Used In Year 2

Welcome to Group Quest. We have prepared audio instructions to tell you all about today's study.

The purpose of today's experiment will be for you all to complete an interactive multiplayer computer game called Groupquest. Your goal will be to beat all the quests as fast as you can!

However, before you play the game, you will be able to form a group identity for your group. Studies have found that forming a group identity is essential for group members to be able to perform well together as a group. To form your group identity you will create a coat of arms!

Before we show you how to do this, let's first take a moment to go over a brief history of coats of arms.

Even amongst our most ancient civilizations, humans have used images of animals and nature, as well as the various colors that appear in our natural environment to symbolize their personal, family and tribal identities. This was a common practice among the peoples of ancient Israel, Greece, Egypt and the Aboriginal peoples of North America.

Using colours and pictures to symbolize group identity was formalized into the practice of *armory* during the eleventh century in Europe. Armory is the practice of using distinctive figures and colours on weapons and shields as a means of identification. In medieval Europe the coat of arms was a symbol of a family's heritage. The coat of arms has since become associated with larger groups. For example, military units, provinces and countries still use them.

The practice of armory follows a set of established rules and laws in which the different symbols, components, and colours that appear on the coat of arms represent the specific values and traits that make up a group's identity. By combining these colours and symbols, people can

represent their group's distinctive identity. Armory has even been considered a *science* by some scholars in which "the rules and the laws govern the use, the display, meaning, and knowledge of the pictured signs and emblems appertaining to shield"

What are the components of a coat of arms?

One of the most important components of the coat of arms is the shield. In medieval times, knights would wear their shield on their arm, so that their allies could identify them in battle. Two important features of the shield are the colour of the shield and the charge that appears on it. They symbolize the values and traits that are most central to the group identity being represented.

Another important feature of the coat of arms is the Motto that appears beneath the shield. The motto is a phrase that states the basic philosophy of the family or group. As well, the coat of arms may contain an Upper Ribbon that displays the name of the group.

In today's study, the importance of forming your group identity goes beyond getting to know each other. The identity that you form will have an impact on *everything you do in Group Quest*.

Depending on the values and attributes that you and your group choose, the unit which you will control in Group Quest will have different abilities and special characteristics. In other words, your coat of arms will have a direct impact on how you will play the Group Quest game! While all combinations of charges and colours will provide a different experience in the game, the overall advantage of any combination is the same! Think carefully about what values and traits you all share together as a group as you create your arms.

(Explanation Given To Participants Assigned to the Collective Autonomy Support or Collective Autonomy Threat Conditions)

For the purpose of our study, we need one of the two groups to be able to review the other group's coat of arms and make changes to their coat of arms if they choose.

At the beginning of the experiment, your group picked one of two envelopes out of the hat. The message contained in your envelope will tell you whether your group gets to look at the other group's coat of arms, or whether the other group has this ability. If the winning group dislikes the other group's coat of arms, they are allowed to make changes to it.

The experimenter will now open the envelope and show you its contents.

(***Explanation Given To Participants Assigned to the Collective Autonomy Support or Collective Autonomy Threat Conditions)***

For the purpose of our study, we need one of the two groups to be able to decide where they would like to play Group Quest, right before the game starts.

At the beginning of the experiment, your group picked one of two envelopes out of the hat. The message contained in your envelope will tell you whether your group gets to decide in which room they want to play Group Quest, or whether the other group has this ability. If the winning group dislikes the room to which they have been assigned, they are allowed to switch rooms with the other group before playing the video game.

The experimenter will now open the envelope and show you its contents.

Variables Reported in Main Text

Collective Autonomy

Instructions: The following questions pertain to how you feel that your group was treated by the other group partaking in the study when you created your Coat of Arms and determined your group's identity. You may disagree or agree with these statements and there are no right or wrong answers. Please use the following 7-point scale to indicate the extent to which you agree with each of these statements on a scale of 1 "strongly disagree" to 7 "strongly agree".

1. We were free to determine our own group identity.
2. We were free to determine what attributes we share as a group.
3. We were free to determine what values we share as a group.
4. The other group pressured our group to adopt values that were not our own.
5. The other group imposed things onto our group's identity.
6. The other group told our group what we could and could not do.
7. We were able to determine our own group identity - we determined who we are as a group.
8. We felt that we could make decisions about our group's identity independently from the other group.
9. We felt pressured by the other group.
10. We felt controlled by the other group.
11. We were able to decide our group's actions- we determined what we did as a group.

Personal Autonomy (Personal autonomy items (bolded and underlined here for clarity) were imbedded within a larger questionnaire assessing the basic needs (relatedness, competence, and personal autonomy):

Instructions: Please rate your agreement with the following statements, bearing in mind your feelings DURING THE ENTIRE STUDY. You may disagree or agree with these statements and there are no right or wrong answers. Please use the following 7-point scale to indicate the extent to which you agree with each of these statements on a scale of 1 "strongly disagree" to 7 "strongly agree".

1. I felt a sense of contact with the members of my group.
2. I experienced some kind of failure, or was unable to do well at something.
3. **I was free to do things my own way.**
4. **I had a lot of pressures I could do without.**
5. I felt unappreciated by one or more people.
6. I took on and mastered hard challenges.
7. I felt close and connected with the members of my group.
8. I did something stupid, that made me feel incompetent.
9. I did well even at the hard things.
10. **I had to do things against my will**
11. I had disagreements or conflicts with the members of my group.
12. **I was really doing what interests me.**

Variables Reported in Supplemental Analyses

Group Power: On a scale of 1 to 7, how much do you agree with the following statements?

(3 items adapted from Shnabel and Nadler, 2008):

1. During the study we felt relatively strong as a group.
2. During the study we had a lot of influence on what we did.
3. During the study we had a lot of control over what we did.

Base-line enjoyment of playing video games:

1. How much do you enjoy playing video games or computer games in general.

Ingroup autonomy support from other ingroup members during the experiment

1. The members of my group understood me.
2. The members of my group were able to be open with me.
3. The members of my group conveyed confidence in my abilities.
4. I had a lot of trust in the members of my group.
5. When I asked the members of my group questions they answered these questions fully and carefully.
6. The members of my group listened to how I would like to do things.
7. The members of my group handled my emotions very well.
8. The members of my group cared about me.
9. I don't feel very good about the way the members of my group talked to me.

List of additional variables assessed in Study 2, that are beyond the scope of present research or which could not be utilized because of only being assessed during one year of testing.

1. **Intrinsic Motivation Felt When Creating Coat of Arms** (7 items- Intrinsic Motivation Inventory – e.g., Tsigilis, & Theodosiou, 2003, included both year)
2. **Intrinsic Motivation When Playing Group Quest (**7 items- Intrinsic Motivation Inventory – e.g., Tsigilis, & Theodosiou, 2003, included both years**)** when playing group quest. Please note that we did not find differences in results on these items from what we find using the enjoyment item assed during game play.
3. **Measure of Collective Autonomy which *does not* make reference to the outgroup** (For student honours thesis; second half of year 1 only)
4. **Self-report scale of enjoyment when playing Group Quest and Controlling the Ingame Avatar (Second year only).**
5. **Free choice paradigm and follow-up questions to assess intrinsic motivation to play Group Quest (**Year one only)
6. **Desire for Group Power (**Shnabel & Nadler, 2008, included both years**)**
7. **Wellbeing Assessed Via Positive Affect and Self-Esteem (**included Year 1 only)
8. **Group identification scale (**9 items – Cameron, 2004 – included both years).
9. **Group Identification During Game Play (**assessed at T=7, 14, and 21 minutes; included during both years).
10. **Feelings of Pressure During Game Play** (assessed at T=7, 14, and 21 minutes; included year 2 only).

11. **Feeling of Positive Affect During Game Play (**assessed at T=7, 14, and 21 minutes ; included year 2 only)
12. **Outgroup Bias:** Hypothetical scenario assessing how group members would divide 100 dollars between their group and the outgroup (Year 1 only).
13. **Outgroup Hostility:** Series of hypothetical vignettes assessing behavior intent to retaliate towards the outgroup (For honors thesis: year 2 only).
14. **Perception of size of coins (**For honors thesis: used as an implicit measure of need for personal power; year 2 only).
15. **Subjective perceptions of the room in which participants engaged in the study** (For honors thesis: both years).
16. **Participants' subjective memory of the shade of colours depicted in the coat of arms generator (**For student honours thesis; Year 2 only).
17. **Group Distinctiveness (Measured during Year 1 only)**

Study 3, Manuscript 1: Complete Questionnaire Materials

Core Cultural Group Identification Task

What cultural group do you identify with most?

People identify to differing degrees with different social groups. One type of social group that we belong to, is a core cultural group. This is the group you refer to naturally when people ask you what your background is, and you reply "I am x". Some people may identify with broad national groups, and respond to such questions by saying "I am Canadian" or "I am Indian". Others may identify with more specific groups, such as a religious or ethnic subgroup within a broader national group and may reply in ways more like these examples: "I am a Jewish-Canadian", "I am a Canadian Jew", "I am Indo-Canadian", or "I am Quebecois".For this questionnaire we will ask you questions about your core cultural group- the cultural group you identify with most. This can be the culture of your birth, the culture in which you were raised, or another culture that forms part of your background. For some this will be easy, however for many we know that determining what your core culture can be hard to do, as you may feel that you identify with more than one culture, or no culture at all. Nevertheless, please do your best to pick the culture that you identify most strongly with, and the culture that you feel most "makes you who you are". Feel free to respond to this as naturally as you can.In the text box below the circle, write down the cultural group that you identify with the most (e.g. "Jews." "Koreans." "the Irish." "Asians." "New Yorkers." "Chinese-American.")

WE are:

What context do you see your core cultural group ({{WEare}}) In?

The social contexts that affect our cultural groups are complex and there are many of them. Different contexts will matter to different people. For example, someone who identifies with the culture in which they were born may think primarily of that immediate cultural milieu. Another person who has immigrated from his/her homeland to live in the United States may frequently think about members of his/her culture back home in their country of origin. Another person who has immigrated from his/her homeland to the United States may think more frequently about other members of his/her culture who are also living in the United States. For other cultural groups that have experienced Diaspora you may see your group as being spread in different locations across the globe. When you answer this survey, we want you to think about your cultural group ({{ WEare }}) in the context that matters the most to you.To help you do so, here is a world map. Which georgraphic area do you most strongly associate with your core cultural group ({{ WEare }})? Please look at the world map to locate this area, then write down the

name of this area below the map. This could be a country, a state, a province, a city, or even a community within a city. If more than one space comes to mind, feel free to write all of them in the space.

Type the name of the area(s):

What other cultural group interacts with your group the most?

In this survey, we will ask you questions about how the members of your core cultural group have interacted with other cultural groups and how your core cultural group is compared to other cultural groups. Of course the world is filled with many cultures, but we want to know about the other group that has interacted with your group ({{WEare}}) the most and has influenced your group the most. For example, an Indian may think of Pakistani people, or the British. An immigrant living in Canada may think of mainstream Canadians. To help you conceptualize this more clearly, we would like you to fill in the shapes below. In the text box below the circle, we would like you to write the name of your core cultural group again ("Who we are").In the text box below the rectangle, we would like you to write the name of the other cultural group that has interacted with your cultural group the most ("Who they are").(e.g. "Jews." "Koreans." "the Irish." "Asians." "New Yorkers." "Chinese-American.")

WE are:{{WEare}}

THEY are:

Power

Slide the cursor towards the group with the most power. The closer the cursor is to a group's name, the more power this group has. If both groups have equal power, leave the cursor to 0.

Quality of Relations

Place the cursor closer to "positive" or "negative" depending on the degree to which your group and the other group get along well. Leaving the cursor to 0 means that the quality of relations is neutral.

What context do you see the other group ({{THEYare}}) In?

We would now like you to think about where you see the group that interacts with your group the most ({{THEYare}}).To help you do so, here is a world map. Which geographic area do you most strongly associate with the other group ({{ THEYare }})? Please look at the world map to locate this area, then write down the name of this area below the map. This could be a country, a state, a province, a city, or even a community within a city. If more than one space comes to mind, feel free to write all of them in the space.

Type the name of the area(s):

EXPERIMENTAL MANIPULATION – WRITING TASK

Neutral Condition (Analyzed in Supplemental Analyses)

Our cultural identity tells us who we are as a people. A cultural identity tells us what values we share and have in common as a group. It tells us about the customs and practices we all take part in - the staple foods of our culture, our music, and the ways that we celebrate with family and our traditions. In a detailed paragraph describe aspects of your cultural group's identity. These may include your own shared values, customs and practices.

How is your group affected by the above, in the present day?

Following the neutral prime, participants were asked the following two questions for exploratory purposes.

1) How hard was it for you think of aspects of your cultural group's identity?

2) How hard was it for you to describe aspects of your cultural group's identity?

Collective Autonomy Support Condition

Our cultural identity tells us who we are as a people. A cultural identity tells us what values we share and have in common as a group. It tells us about the customs and practices we all take part in - the staple foods of our culture, our music, and the ways that we celebrate with family and our traditions.It is important that every cultural group in the global community is the author of its own cultural identity- that each cultural group can determine its own set of values, customs and practices as a group and that group members feel free and accepted to practice their cultural customs in society at large. 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.

How is your group affected by the above, in the present day?

Following the collective autonomy support prime, participants were asked the following seven questions for exploratory purposes.

1) In terms of the time line of your group's history when did this event occur?

- ○ a) Present Day (it is still occurring)
- ○ b) Recent History (last 25 years)
- ○ c) Moderately Distant History (25- 50 years ago)
- ○ d) Distant History (50 to 100 years ago)
- ○ e) Ancient History (>100 years ago)

2) To what extent do you think that this event is a defining historical event for your group's identity?

3) To what extent do you think that this event has had a positive effect on the overall well-being of members in your group?

4) To what extent do you think that this event has had a negative effect on the overall well-being of members in your group?

5) In terms of the time line of your group's history until when did this event affect members of your group?

- a) Present Day (it is still occurring)
- b) Recent History (last 25 years)
- c) Moderately Distant History (25- 50 years ago)
- d) Distant History (50 to 100 years ago)
- e) Ancient History (>100 years ago)

6) How hard was it for you think of this example?

7) How hard was it for you to describe this example?

Collective Autonomy Threat Condition

Our cultural identity tells us who we are as a people. A cultural identity tells us what values we share and have in common as a group. It tells us about the customs and practices we all take part in - the staple foods of our culture, our music, and the ways that we celebrate with family and our traditions.It is important that every cultural group in the global community is the author of its own cultural identity- that each cultural group can determine its own set of values, customs and practices as a group and that group members feel free and accepted to practice their cultural customs in society at large. However, it is not always the case that cultural groups have the freedom to determine all aspects of their cultural identity. There are points in the history of any cultural group in which they have been at least somewhat controlled and pressured by other groups. This may involve other groups pressuring your own cultural group to adopt certain values or to behave in certain ways. Or this may involve feeling that other groups do not support members of your own group in following your own cultural customs and practices. 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.

How is your group affected by the above, in the present day?

Following the collective autonomy threat prime, participants were asked the following eight questions for exploratory purposes.

1) In terms of the time line of your group's history when did this event occur?

- ○ a) Present Day (it is still occurring)
- ○ b) Recent History (last 25 years)
- ○ c) Moderately Distant History (25- 50 years ago)
- ○ d) Distant History (50 to 100 years ago)
- ○ e) Ancient History (>100 years ago)

2) To what extent do you think that this event is a defining historical event for your group's identity?

3) To what extent do you think that this event has had a positive effect on the overall well-being of members in your group?

4) To what extent do you think that this event has had a negative effect on the overall well-being of members in your group?

5) In terms of the time line of your group's history until when did this event affect members of your group?

- ○ a) Present Day (it is still occurring)
- ○ b) Recent History (last 25 years)

- c) Moderately Distant History (25- 50 years ago)
- d) Distant History (50 to 100 years ago)
- e) Ancient History (>100 years ago)

6) To what extent do you feel that your group has been able to overcome this loss of control as a group?

7) How hard was it for you think of this example?

8) How hard was it for you to describe this example?

Variables Reported In Main Text Analyses

Note that we did not re-write all scale items because we used the exact same items as were used to assess these constructs in Study 1 (please see above for detailed description of the items).

- Collective autonomy
- Personal autonomy
- Self-esteem
- Life satisfaction
- Depression inventory
- Self-actualization

Variables Reported In Supplemental Analyses

Note that we did not re-write all scale items because we used the exact same items as were used to assess these constructs in Study 1 (please see above for detailed description of the items).

- Perceived discrimination
- Regulatory style for practicing culture
- Personal autonomy support from other ingroup members
- Group Identification
- Feelings of Group Power

APPENDIX C: Supplemental Analyses and Supplemental Study for Manuscript 2

Supplemental Analyses 12: Relation between Black Americans' perception of collective autonomy and their desire to move up the social ladder (Study 2, Manuscript 2).

In Study 2, participants were provided with images of a "social ladder" with ten rungs labeled 1 (the bottom rung) to 10 (the top rung). Participants were told that: "The top of the ladder represents groups that are the best off- those that have the most power, the most resources, and the most respect. At the bottom are the groups that are the worst off – they have the least power, the least resources, and the least respect." Participants had to rate where they felt their group (Black Americans) and White Americans stood on the ladder from 1 "groups of lowest power and status" to 10 "groups of highest power and status". Participants indicated on 4 separate ladders where they felt: (1) Black Americans *actually* stand in terms of power and status, (2) White Americans *actually* stand in terms of power and status, (3) Black Americans should *ideally* stand in terms of power and status, and (4) where White Americans should *ideally* stand in terms of power and status. Table S23 describes the means for each ladder score as well as the correlation between collective autonomy and each ladder score.

	Mean	Standard Deviation	Correlation with Collective Autonomy Restriction
Actual Position of Blacks	4.80	2.31	-0.09
Actual Position of Whites	8.90	1.57	0.05
Ideal Position of Blacks	8.41	2.06	0.02
Ideal Position of Whites	8.38	2.01	-0.02

Table S23. *Participants perceived actual and ideal standing of Whites and Blacks on a social ladder (Study 2, Manuscript 2)*

Interpretation of the results to this scale is challenging because the ladder represented both group power and group status which are distinct constructs (e.g., Sachdev & Boris, 1991). While we expect that experiencing restrictions to collective autonomy will be related to a greater desire for power it is not clear how collective autonomy would impact group members' desire to be a high-status group in society.

Supplemental Analyses 13: Repeating analyses using system stability items independently (Study 2, Manuscript 2).

Alternative assessment of system stability. Because of the relatively weak correlation between the two items used to assess system stability we repeated our analyses using both items as separate variables. Perceptions of restrictions to one' collective autonomy still uniquely predicted group members' support for collective action, β=.23, *B*=.18, *SE*=.04, 95% CI=[.11, .26], $p<.001$, $R^2_{change}=.04$, group members' support for the Black Panther Party, β=.24, *B*=6.33, *SE*=1.57, 95% CI=[3.24, 9.43], $p<.001$, $R^2_{change}=.05$, and group members' system justification, β=-.14, *B*=-.12, *SE*=.04, 95% CI=[-.20, -.03], $p=.006$, $R^2_{change}=.02$.

Supplemental Analyses 14: Repeating the analyses of Study 3 (Manuscript 2) when subdividing the sample by the year in which the study was conducted

Data collection for Study 3 was conducted over the period of two years. Two hundred and nineteen participants were recruited in year one. After excluding participants with missing data for our key outcomes of collective autonomy and desire for group power, 215 participants remained (50 groups in total; collective autonomy restriction, N= 73, 16 groups; collective autonomy support, N= 69, 16 groups; control condition, N=73, 18 groups). During the second year 196 participants were recruited. After excluding participants because of missing data, 179 participants (45 groups) remained in the year two sample (collective autonomy restriction, N= 62, 15 groups; collective autonomy support, N= 55, 14 groups; control condition, N=62, 16 groups).

To gain further confidence in our results, we repeated our primary analyses when sub-dividing our sample on the basis of which year participants took part in the study. The effect sizes and pattern of results when sub-dividing by year for both sub-samples were largely consistent with what we find with the total sample, and support for our primary hypotheses. However, we lacked statistical power when dividing the sample by year to detect significant results on all effects (See Table S24).

We also wanted to ensure that our observed results using the complete data set remained consistent when controlling for the potential effect of the year during which participants took part in the study. We found no significant effect of year on perceptions of collective autonomy (Table S25). However, we did find a significant effect of year on desire for power such that group members tended to report a lower desire for power during the second year relative to the first year. Critically however, we observed no interaction between condition and year on desire for power, indicating that the effect of condition on desire for power was consistent across both years. Moreover, we repeated our primary analyses using the total sample when controlling for the year during which participants took part in the study. Consistent with the results reported in the main text, condition had a significant effect on collective autonomy and desire for group power when controlling for the year during which the study was run (Table S26).

Outcome	Sample	Restriction vs. Control	Restriction vs. Support	Control vs. Support
Collective Autonomy				
	Year 1	γ=2.20, *95% CI*=[1.94, 2.47], *t*(212)=16.16, *p* <.001, *r*=.74, Power=1	γ=1.97, *95% CI*=[1.70, 2.24], *t*(212)=14.23, *p* <.001, *r*=.70, Power=1	γ = -.24, *95% CI*=[-.51, .04], *t*(212)= -1.71, *p*=.10, *r*=.12, Power=.36
	Year 2	γ=1.79, *95% CI*=[1.46, 2.09], *t*(40.39)=11.05, *p* < .001, *r*=.87, Power=1	γ=1.94, *95% CI*=[1.61, 2.26], *t*(39.47)=11.68, *p* <.001, *r*=.88, Power=1	γ=.16, *95% CI*=[-.17, .49], *t*(39.47)=.96, *p* =.34, *r*=.15, Power=.15
	Combined Sample	γ=2.01, 95% *CI* [1.81, 2.21], *t*(391)=19.35, *p*<.001, *r*=.70, Power=1	γ=1.95, 95% *CI* [1.75, 2.16], *t*(391)=18.42, *p*<.001, *r*=.68, Power=1	γ= -.05, 95% *CI* [-.26, .15], *t*(391)=-.52, *p*=.61, *r*=.03, Power=1
Desire for Group Power				
	Year 1	γ=-.95, *95% CI*=[-1.42, -.49], *t*(44.93)=-4.01, *p* < .001, *r*=.51, Power=.98	γ=-.48, *95% CI*=[-.96,-.01], *t*(44.97)=-1.99, *p* = .05, *r*=.28, Power =.52	γ=.47, *95% CI*=[.004, .94], *t*(44.87)=1.98, *p* =.05, *r*=.28 Power=.52
	Year 2	γ=-.35,*95% CI*=[-.87, .18], *t*(42.21)=-1.30, *p*=.20, *r*=.20, Power=.26	γ=-.64, *95% CI*=[-1.18, -.10], *t*(41.49)=-2.31, *p*=.03, *r*=.34, Power=.67	γ=-.29, *95% CI*=[-.83, .25], *t*(41.49)=-1.05, *p* =.30, *r*=.16, Power =.17
	Combined Sample	γ=-.66, 95% *CI* [-1.03,-.30], *t*(89.9)=-3.59, *p*=.001, *r*=.35, Power=.95	γ=-.53, 95% *CI* [-.91, -.16], *t*(89.9)=-2.81, *p*=.006, *r*=.28, Power=.83	γ=.13, 95% *CI* [-.24, .50], *t*(92.48)=.71, *p*=.48, *r*=.07, Power=.09

Table S24. *The effect of condition on collective autonomy and desire for power by sub-year for Study 3, Manuscript 2. Observed (post-hoc) power estimates are provided for each contrast.*

	Effect of Year
Collective Autonomy	γ=-.15, *95% CI*=[-.56, .26], *t*(96.29)=-.70, *p*=.49, *r*=.07
Desire for Group Power	γ=-.36, *95% CI*=[-.67, -.04], *t*(92.55)=-2.24, *p*=.03, *r*=.23

Table S25*: The effect of year on collective autonomy and desire for group power, Study 3, Manuscript 2. Study was dummy coded such that Year One was equal to "0" and Year Two was equal to "1".*

	Restriction vs. Control	Restriction vs. Support	Control vs. Support
Collective Autonomy	γ=2.01, *95% CI*=[-1.02, -.31], *t*(390)=19.36 *p*<.001, *r*=.70	γ=1.95, *95% CI*=[-.90, -.18], *t*(390)=18.41, *p*<.001, *r*=.68	γ =-.06, *95% CI*=[-.26, .15], *t*(390)=-.53, *p*=.60, *r*=.03
Collective Action Support	γ=-.67, *95% CI*=[.04, .52], t(89.64)=-3.69 *p*<.001, *r*=.36	γ=-.54, *95% CI*=[.06, .56], *t*(89.08)=-2.43, *p*=.02, *r*=.25	γ =.13, *95% CI*=[-.23, .49], *t*(92.29)=.69, *p*=.49, *r*=.07

Table S26. *The effect of condition on collective autonomy and desire for group power while controlling for the year during which the study was run, Study 3, Manuscript 2. Study was dummy coded such that Year One was equal to "0" and Year Two was equal to "1".*

Supplemental Analyses 15: Repeating the analyses of Study 3 (Manuscript 2) while controlling for the number of people in participants' unique group

The size of groups varied between 3 to 5 people. We wanted to ensure that our observed results remained significant when controlling for the potential effect of group size. We found no significant effect of group size on perceived collective autonomy (Table S27). Group size did have a significant effect on group members' desire for group power such that people tended to express a greater desire for power in larger groups. Critically however, there was no significant interaction between group size and condition on desire for power, indicating that the effect of condition on group members' desire for power was consistent regardless of group size. Moreover, the effect of condition on all outcomes remained significant when controlling for group size (see Table S28).

	Effect of Group Size on Key Outcome
Collective Autonomy	γ=-.09, *95% CI*=[-.39, .21], *t*(98.75)=-.59, *p*=.56, *r*=.06
Desire for Group Power	γ=.39, *95% CI*=[.16, .62], *t*(102.18)=3.36, *p*=.001, *r*=.32

Table S27. *The effect of group size on collective autonomy and desire for group power, Study 3, Manuscript 2.*

Outcome	Restriction vs. Control	Restriction vs. Support	Control vs. Support
Collective Autonomy	γ=2.01, *95% CI*=[1.80, 2.21], *t*(89.45)=19.24, *p*<.001, *r*=.90	γ=1.95, *95% CI*=[1.75, 2.16], *t*(88.48)=18.39, *p*<.001, *r*=.89	γ =-.05, *95% CI*=[-.26, .16], *t*(92.46)=-.49, *p*=.62, *r*=.05
Desire for Group Power	γ=-.62 *95% CI*=[.17, .65], *t*(91.23)=-3.46 *p*<.001, *r*=.34	γ=-.53, *95% CI*=[.27, .76], *t*(90.67)=-2.91, *p*=.005, *r*=.29	γ =.09, *95% CI*=[-.14, .35], *t*(93.66)= .49, *p*=.62, *r*=.05

Table S28. *The effect of condition on collective autonomy and desire for group power while controlling for the size of participants' unique group, Study 3, Manuscript 2. We compared the fit of the proposed model to a model only including group size and participants' unique group as predictors.*

Supplemental Analyses 16: Examining the effect of condition on participants' perceptions of group strength and group identification (Study 3, Manuscript 2)

In Study 3, we differentiated collective autonomy from two potentially overlapping variables: feelings of group strength and group identification. Providing specificity for our results, we found no significant effect of condition on these two potentially overlapping variables (See Table S29). Moreover, the observed pattern of results remained consistent when controlling for group strength and group identification (Table S30).

Outcome	ICC	Restriction vs. Control	Restriction vs. Support	Control vs. Support
Group Strength	.44, 95%*CI*[.41,.47]	γ=-.43, *95% CI*=[-.94, .09], *t*(91.33)=-1.63 *p*=.11, *r*=.17	γ=-.20, *95% CI*=[-.73, .32], *t*(91.10)=-.76 *p*=.45, *r*=.08	γ=.22, *95% CI*=[-.30, .74], *t*(93.25)=.84 *p*=.40, *r*=.23
Group Identification	.23, 95%*CI*[.16,.33]	γ=.01, *95% CI*=[-.22, .24], *t*(88.66)=.09 *p*=.93, *r*=.01	γ=.18, *95% CI*=[-.06, .41], *t*(87.76)=1.47 *p*.14, *r*=.16	γ=.17, *95% CI*=[-.07, .40], *t*(92.09)=1.38 *p*=.17, *r*=.14

Table S29. *The effect of condition on the potentially overlapping variables accounted for in Study 3, Manuscript 2 (Group Strength and Group Identification).*

Outcome	Restriction vs. Control	Restriction vs. Support	Control vs. Support
Collective Autonomy	γ=1.95, *95% CI*=[1.75, 2.16], *t*(380.00)=18.86, *p*<.001, *r*=.70	γ=1.88, *95% CI*=[1.67, 2.08], *t*(380.00)=17.81, *p*<.001, *r*=.67	γ =-.07, *95% CI*=[-.28, .13], *t*(380.00)= -.68, *p*=.49, *r*=.03
Desire for Group Power	γ=-.58, *95% CI*=[-.95,-.22], *t*(88.50)=-3.14 *p*=.002, *r*=.32	γ=-.50, *95% CI*=[-.88, -.13], *t*(87.90)=-2.66, *p*=.009, *r*=.27	γ =.08, *95% CI*=[-.29, .45], *t*(91.50)=.42, *p*=.68, *r*=.04

Table S30. *The effect of condition on the primary outcomes of collective autonomy and desire for group power while controlling for the size of participants' unique group, Study 3, Manuscript 2. We compared the fit of the proposed model to a model only including group size and participants' unique group as predictors.*

Supplemental Analyses 17: Repeating the analyses of Study 4 (Manuscript 2) while controlling for the number of people in participants' unique group

The size of groups varied between 3 to 4 people. We wanted to ensure that our observed results remained significant when controlling for the potential effect of group size. We found no significant effect of group size on key outcome variables assessed either at the individual group member level (Table S31) or at the group level (Table S32). Moreover, our observed results at the individual group member level (see Table S33) and at the group level (see Table S34) remained consistent when we included group size as a covariate in our analyses.

	Effect of Group Size on Key Outcome
Collective Autonomy	γ=.73, *95% CI*=[-.18, 1.64], *t*(89.82)=1.57, *p*=.29, *r*=.16
Perceived Inequality	γ=-.12, *95% CI*=[-.82, .59], *t*(88.81)=-.32, *p*=.75, *r*=.03
Collective Action Support	γ=-.31, *95% CI*=[-.67, .04], *t*(96.57)=-1.73, *p*=.09, *r*=.17
System Justification	γ=.07, *95% CI*=[-.39, .53], *t*(93.59)=.30, *p*=.76, *r*=.03

Table S31. *Multilevel analyses assessing the effect of group size on key outcomes of perceived collective autonomy, perceived inequality, collective action support and system justification assessed at the individual group member level (Study 4, Manuscript 2).*

	Effect of Group Size on Key Outcome
Collective Action Support	β=-.13, *B*=-.27, *SE*=.21, 95% CI=[-.68, .14], *p*=.19, R^2_{change}=.02
System Justification	β=.07, *B*=.20, *SE*=.28, 95% CI=[-.35, .75], *p*=.47, R^2_{change}=.005
Verbal Expressions of Dissatisfaction and System Challenge (Number of Instances)	β=-.05, *B*=-.27, *SE*=.57, 95% CI=[-1.40, .87], *p*=.64, R^2_{change}=.002

Table S32.1. *Linear regression assessing the effect of group size on key continuous outcomes of collective action support, system justification, and verbal expressions of dissatisfaction and system challenge assessed at the group level (Study 4, Manuscript 2).*

	Effect of Group Size on Key Outcome
Behavioral Engagement in Collective Action (Presence or Absence)	*b*=.05, *W*=.009, *p*=.93, 95%CI *Exp(b)*[.37,2.95]

Table S32.2. *Logistic regression assessing the effect of group size on the dichotomous outcome of behavioral engagement in collective action at the group level (Study 4, Manuscript 2).*

Outcome	Main Effect of Collective Autonomy	Main Effect of Equality	Effect of Interaction (Added into model in second step)
Collective Autonomy	γ=-4.05, *95% CI*=[-4.37, -3.73], *t*(89.14)=-24.26, *p*<.001, *r*=.93	γ=.25, *95% CI*=[-.07, .57], *t*(89.24)=1.51, *p*=.13, *r*=.16	γ =-.16, *95% CI*=[-.80, .48], *t*(88.81)=-.48, *p*=.63 *r*=.05
Inequality	γ=1.25, *95% CI*=[.80, 1.71], *t*(88.87)=5.33, *p*<.001, *r*=.49	γ=2.03, *95% CI*=[1.58, 2.48], *t*(88.67)=8.67, *p*<.001, *r*=.68	γ =-2.22, *95% CI*=[-3.00, -1.44], *t*(87.56)= -5.48, *p*<.001, *r*=.51
Collective Action Support	γ=.85, *95% CI*=[.56, 1.14], *t*(102.17)=5.74, *p*<.001, *r*=.49	γ=.61, *95% CI*=[.33, .89], *t*(101.77)=4.22, *p*<.001, *r*=.39	γ =-.21, *95% CI*=[-.77, .35], *t*(101.44)= -.73, *p*=.47, *r*=.07
System Justification	γ=-1.19, *95% CI*=[-1.52, -.86], *t*(98.96)=-6.99, *p*<.001, *r*=.57	γ=-.93, *95% CI*=[-1.25, -.61], *t*(99.08)=-5.60, *p*<.001, *r*=.49	γ =-.21, *95% CI*=[.17, 1.44], *t*(98.99)=2.46, *p*=.02, *r*=.24

Table S33. *Multilevel analyses assessing the effect of the collective autonomy manipulation and inequality manipulation on the primary outcomes assessed at the individual group member level (collective autonomy, perceived equality, collective action support, system justification) controlling for the size of participants' unique group (Study 4, Manuscript 2). We compared the fit of the main effects model to a model only including group size and participants' unique group as predictors.*

Outcome	Main Effect of Collective Autonomy	Main Effect of Equality	Interaction Effect
Collective Action Support	$F(1,97)=17.27$, $p<.001$, $\eta^2=.15$	$F(1,97)=12.41$, $p<.001$, $\eta^2=.11$	$F(1,97)=.02$, $p=.88$, $\eta^2=.00$
System Justification	$F(1,97)=24.74$, $p<.001$, $\eta^2=.20$	$F(1,97)=17.53$, $p<.001$, $\eta^2=.15$	$F(1,97)=1.10$ $p=.30$, $\eta^2=.01$
Verbal Expressions of Dissatisfaction and System Challenge (Number of Instances)	$F(1,88)=51.69$, $p<.001$, $\eta^2=.37$	$F(1,88)=.15$, $p=.70$, $\eta^2=.002$	$F(1,88)=.34$ $p=.55$, $\eta^2=.004$

Table S34.1. *Two-way ANOVA assessing the effect of the collective autonomy manipulation and equality manipulation on the primary continuous outcomes assessed at the group level (collective action support, system justification, and verbal expression of dissatisfaction and system justification) controlling for the size of participants' unique group (Study 4, Manuscript 2).*

Outcome	Main Effect of Collective Autonomy	Main Effect of Equality
Behavioral Engagement in Collective Action (Presence or Absence)	$b=2.33$, $W=10.54$, $p<.001$, 95%CI *Exp(b)*[2.52, 42.00]	$b=1.77$, $W=7.49$, $p=.006$, 95%CI *Exp(b)*[1.65,20.89]

Table S34.2. *Logistic regression assessing the effect of the collective autonomy manipulation and equality manipulation on the dichotomous group level variable of groups' behavioral engagement in collective action, controlling for the size of participants' unique group (Study 4, Manuscript 2).*

Supplemental Study 1

In Supplemental Study 1 we further compared the power motives and collective action intentions of low-power groups who lacked societal influence and scarce resources but had their collective autonomy *supported* by the high-power group to low-power groups who lacked societal influence and scarce resources, and also had their collective autonomy *restricted* by the high-power group. We expected that low-power group members who had their collective autonomy restricted would desire power and engage in collective action to a greater extent relative to low-power groups who had their collective autonomy supported. We were also interested in comparing groups who lacked power in terms of influence and scarce resources but had their collective autonomy supported, to groups who had relatively equal power as the outgroup. In accordance with Lammers' (2016) findings at the individual level we did not expect differences between these two groups.

Complementing the experimental paradigm used in Study 3 and Study 4 we developed a novel experimental paradigm in which groups of participants (n=2-3) created a graphic novel to describe the relations between two groups of people living on a fictional planet that we called "Grabodia". Participants took on the role of one group of Grabodians, that shared the planet with another Grabodian outgroup. Within their graphic novel, groups described and illustrated the culture of their ingroup and the outgroup, as well as an intergroup event they imagined taking place between their ingroup and the outgroup. It was through the group's description of the intergroup event that we could assess how the ingroup imagined engaging in collective action towards the outgroup.

Method

Sample. One hundred and forty one participants were recruited from the McGill University community to partake in a study on group creativity. Participants were compensated with 2 extra course credits in a psychology class or 20$ for their participation. Three participants were excluded because they had to create the graphic novel alone due to participant cancelations. Two responses were excluded because they completed the study twice[34]. Results from the remaining 136 participants (102 Female, 34 Male; M_{age}= 20.72, SD_{age}= 3.53) and 53 independent groups are reported. Eighteen groups (N=48 individual participants) were assigned to the equal power condition, 17 groups (N=44 individual participants) were assigned to the collective autonomy restriction condition, and 18 groups (N=44 individual participants) were assigned to the collective autonomy support condition.

Procedures and materials. Participants engaged in the study in groups of two to three people[35]. Group members were given the template of a 25-page graphic novel (see Supplemental Materials) that provided information about the ostensible purpose of the experiment, basic information about a planet named Grabodia, the two groups that inhabited the planet (the Hoye and the Arado), and preliminary information concerning the intergroup dynamics between the

[34] We included the data from these two participants the first time they completed the study.
[35] One group had 4 participants because of a scheduling error. Including or excluding this group did not significantly impact our results. Furthermore, our results did not change when controlling for group size.

two groups. In addition to the graphic novel, group members received artistic markers, pencils, pencil-crayons and pens with which to complete the graphic novel. Participants were asked to imagine that they were members of the Hoye group, and were instructed to tell the story of Grabodia from the perspective of their Hoye group. Groups were given one hour and a half to complete the novel. Groups on average took 87.23 minutes (*SD*=10.24) to complete the graphic novel. In order to support our cover story, participants were told that they would be audio recorded as they developed the graphic novel so that we could explore how collective processes emerged within the group as they developed the novel. Groups were left alone in the room to create the novel, and were checked on every 30 minutes so that they could be notified of the time remaining to complete the novel. Once the group was finished completing the graphic novel, participants answered a questionnaire on an individual basis in which they were asked to answer several questions as members of the Hoye group living on Grabodia.

Experimental manipulation. To manipulate perceptions of relative group power between participants' ingroup (the Hoye), and the outgroup (the Arado), participants were shown a map of Grabodia in which the land distribution of the planet between the groups was visually represented. In the equal power condition, the geographical landscape was equally divided between the Hoye and the Arado (See Figure S1). Participants also read the following:

> The Hoye clan and the Arado clan have been in existence for 2000 years and have lived in close contact with each other during their group's history. We do not know much about the two Grabodian clans except that the Arado and Hoye clans each occupy a part of Grabodia that has 50% of the world's scarce resources. As a result, they are of relatively equal power.

We provided this basic information so that in the equal power condition, participants still felt that both groups interacted with each other, as would be implied in the other conditions.

In both the *collective autonomy restriction condition* and the *collective autonomy support condition,* participants were told that their ingroup was of relatively low power compared to the outgroup. Participants viewed a visual map of Grabodia in which their group occupied only 20% of the planet's territory (See Figure S1). Furthermore, participants read the following:

> We do not know much about the two Grabodian clans except that the Arado clan occupy a part of Grabodia that has 80% of the world's scarce resources. The part of land that the Hoye clan occupy only has 20% of the world's scarce resources. As a result, the Arados have more power than the Hoyes.

Critically, participants in both of the low-power conditions also received an additional page of information detailing whether or not the high power Arado outgroup had historically supported or undermined the collective autonomy of the low-power Hoye group. Specifically, participants in the *collective autonomy restriction* condition read the following:

> Because the Arados have more power than your group they have used this power to influence how your group has been able to determine its cultural identity. As a consequence, during your group's history, the Arados have at times used their power to unduly influence your group's identity and your way of life. Please take this into account

as you write the story of the Hoyes and the Arados.

In contrast, participants in the *collective autonomy support* condition read:

> Although the Arados have more power than your group they have always respected your group's right to determine its own culture. As a consequence, during your group's history the Arados have not tried to influence your group's identity or alter your way of life. Please take this into account as you write the story of the Hoyes and the Arados.

Graphic novel paradigm. Having a tangible and concrete template of the outgroup (as well as of the ingroup) would be important in order for participants to have the basic information necessary to describe an intergroup event between the two groups. Thus, prior to describing the intergroup event, groups described and illustrated what they imagined the culture of their ingroup and outgroup to be like. Specifically, groups illustrated and described the cultural practices, values, habitat, diet, goals, and occupations of the Hoye ingroup and the Arado outgroup. Participants also drew a picture of a Hoye group member and an Arado outgroup member.

The initial instructions in the graphic novel booklet asked the group to describe their ingroup (Hoye) culture. Following their description of their Hoye culture, participants were asked how they imagined life as a Hoye on Grabodia to be (See Supplemental Materials). Of relevance to the present research was one item assessing the extent to which the *group desired power*: "How much would the Hoyes like to increase their group's power? Use a scale of 1 to 7, where 1 is very little and 7 is very much". Following these questions, participants described the culture of the Arado outgroup and illustrated an Arado group member. Groups were then told that a "major intergroup event" had taken place during their recent history (5 years ago) and were asked to describe it in their words.

Two coders who were blind to condition assessed the extent to which each story described the ingroup engaging in hostile collective action towards the outgroup, on a 1 (*no hostility or violence, peaceful*) to 5 *(extremely violent, large scale war, systematic attempts to kill)* scale, (ICC= .81, 95% *CI*=[.56, 90]). This task appeared to be involving for participants: Indeed, some of the instances of hostility described and illustrated within the graphic novels included illustrations of the Hoye (ingroup) and Arado (outgroup) engaging in bloody hand to hand combat, and even more extreme hostile intergroup behavior such as cannibalism (see Figure S2 for an example of a violent conflict illustrated between the Hoye and the Arado). We focused in our coding on hostile collective action on the part of the ingroup towards the outgroup given that such forms of collective action are both the most potentially costly to ingroup members and outgroup members (Wright et al., 1990). The two coders also rated how violent the outgroup was to the ingroup (ICC= .84, 95% *CI*=[.72, 91]). This allowed us to differentiate between the effect of condition on the extent to which groups described their ingroup specifically engaging in hostile collective action towards the outgroup, versus, a general effect of condition in leading group members to see the overall relations between their group and the outgroup as more violent. Given the high inter-rater reliabilities for both outcomes, we computed a mean rater score for ingroup hostility towards the outgroup, and a mean rater score of outgroup hostility towards the ingroup.

Individual Questionnaire. Following their completion of the graphic novel, group members individually completed a brief questionnaire in which they were asked several questions pertaining to what they imagined life would have been like as a Hoye living on the planet of Grabodia. Because the intergroup events could vary dramatically across groups, we asked individual group members to report on their perceptions *prior* to the event, as their perception of the intergroup context prior to the event would have been primarily based on the same information within experimental conditions. All items were rated on a scale of 1 "strongly disagree" to 7 "strongly agree".

Collective autonomy. Participants rated the extent to which they felt that their group lacked collective autonomy prior to the intergroup event by responding to six items: "We (the Hoyes) were free to determine our identity before the major intergroup event"; "Before the big intergroup event, the Arados imposed things onto our group's identity"; "Before the major intergroup event, the Arados told our group what we could and could not do"; "Before the major intergroup event, we felt controlled by the other group"; "We (the Hoyes) have been free to determine what we do as a people before the major intergroup event"; "Before the major intergroup event, the Arados supported the right that we (the Hoyes) have to act in accordance with our identity" (α=.81).

Desire for group power. Desire for group power was assessed with 4 items adapted from Shnabel and Nadler (2008): "Prior to the major intergroup event, our group (the Hoyes) would have liked to have had more say during their interactions with the Arados"; "Prior to the major intergroup event, our group (the Hoyes) would have liked to have had a greater level of control when interacting with the Arados"; "Prior to the major intergroup event, our group (the Hoyes), our group would have liked to have had more power as a group"; "Prior to the major intergroup event, our group (the Hoyes) would have liked to have had more influence as a group" (α=.90).

Results

Analysis strategy. Because the graphic novel was completed at the group level rather than at the individual group member level we used a traditional Ordinary Least Squares model (rather than multilevel modeling with nesting) to analyze the graphic novel data. However, given that individual group members were nested within their unique group, we utilized multilevel modeling whenever analyzing individual-level (versus group-level) responses.

Individual group member responses. The intraclass correlation coefficients (ICCs) for collective autonomy, ICC=.52, 95%*CI*[.49,54], and desire for group power, ICC=.51, 95%*CI*[.48,.54] were both large and significant.

Manipulation check (collective autonomy restriction). As expected, low-power group members who lacked power and had their collective autonomy restricted (*M*=4.39, *SD*=.1.35) perceived significantly less collective autonomy than low-power group members who lacked power but had their collective autonomy supported by the high-power group (*M*=6.15, *SD*=.82), γ=1.84, 95% *CI* [1.32, 2.36], *t*(51.51)=6.96, *p*<.001. Collective autonomy-restricted group members also perceived less collective autonomy than the 'equal-power' group members who were not subject to collective autonomy restriction (*M*=6.00, *SD*=.90, γ=1.71, 95% *CI* [1.20, 2.22], *t*(50.59)=-6.59, *p*<.001. Collective autonomy did not differ between low-power group

members receiving collective autonomy support and group members who had equal power to the outgroup, γ=.13, 95% *CI* [-.38, .63], *t*(54.41)=.50, *p*=.62, further highlighting the theoretical distinction between lacking power and lacking collective autonomy.

Desire for power. Low-power group members in the collective autonomy restriction condition (*M*=4.84, *SD*=1.82) had a significantly greater desire for group power than low-power group members who had their collective autonomy supported (*M*=3.52, *SD*=1.77), γ=-1.22, 95% *CI* [-2.20, -.24], *t*(50.78)=-2.43, *p*=.02, supporting our main hypothesis regarding the link between collective autonomy restriction and group members' desire to pursue power. Collective autonomy restricted group members also tended to desire more power than the *equal-power* group members (*M*=3.98, *SD*=1.66), γ=-.76, 95% *CI* [-1.72, .21], *t*(50.15)=-1.53, *p*=.13, although this difference was not statistically significant. Group members who had their autonomy respected did not differ in their desire for power when compared to group members who were of equal power to the outgroup, γ=-.46, 95% *CI* [-1.40, .48], *t*(56.54)=-.96, *p*=.34.

Group level responses (graphic novel).

Desire for group power. With respect to groups' self-reported desire for group power, one-way ANOVA found a non-significant effect of condition, *F*(2,49)=2.18, *p*=.12,η^2=.08. However, consistent with our results at the individual group member level, low-power groups whose collective autonomy was restricted tended to desire power to a greater extent (*M*=4.63, *SD*=1.95) relative to low-power groups who had their collective autonomy supported by the outgroup (*M*=3.28, *SD*=2.08), *Mean Difference* =1.34, *SE*=.72, *p*=.07 , 95% *CI* [-.11, 2.80]. Collective autonomy-restricted groups also tended to desire power to a greater extent than did groups who had equal power to the outgroup (*M*=3.33, *SD*=2.25), *Mean Difference* =1.29, *SE*=.72, *p*=.08, 95% *CI* [-.16, 2.74]. Collective autonomy supported low-power groups did not report a greater desire for group power than groups who had equal power to the outgroup, *Mean Difference* =-.05 *SE*=.70, *p*=.94, 95% *CI* [-1.46, 1.35].

Collective action. We next examined the effect of condition on coders' continuous ratings of the extent to which groups described their ingroup engaging in hostile collective action during the intergroup event. The Levene's test indicated that the assumption of homogeneity of variance between conditions was violated, *F* (2,50)=11.47, *p*=.001. However, the Brown-Forsythe test confirmed a significant main effect of condition on ingroup hostilty towards the outgroup, *F* (2,37.57)=5.76, *p*=.007. Supporting our hypothesis, low-power group members who had their collective autonomy restricted (*M*=2.68, *SD*=1.41) drew graphic novels in which the ingroup enacted significantly greater hostile collective action towards the outgroup than low-power groups who had their collective autonomy supported by the outgroup (*M*=1.42, *SD*=.60), *Mean Difference* =1.26, *SE*=.38, *p*=.002, 95% *CI* [51, 2.01]. Thus, restrictions to group's collective autonomy appeared to uniquely contribute to low-power group members' imagining themselves engaging in hostile collective action against the outgroup. Collective autonomy restricted low-power groups also described greater hostile collective action then groups in the equal power condition, (*M*=1.81, *SD*=1.18), *Mean Difference* =.87, *SE*=.38, *p*=.025, 95% *CI* [.12, 1.63]. In contrast, low-power groups who had their collective autonomy supported by the

high-power outgroup did not differ significantly from groups in the equal power condition, *Mean Difference* =-.39, *SE*=.37, *p*=.30, 95% *CI* [-1.13, .35].

Using PROCESS (Model 4; Hayes, 2013) and bootstrapping procedure with 5,000 samples we tested whether there was any evidence that groups' desire to pursue power helped to explain the hostile collective action they described in the graphic novel. Supporting this hypothesis, analyses revealed a significant indirect effect of condition on hostile collective action through desire for power when comparing groups in the collective autonomy restriction condition to groups in the collective autonomy support condition, *indirect effect*=-.24, *SE*=.16, 95% *CI*=[-.69, -.02]. Analyses also revealed a significant indirect effect of condition on hostile collective action through desire for power when comparing groups in the collective autonomy restriction condition to groups in the equal power condition, *indirect effect*= -.23, *SE*=.17, 95% *CI*=[-.71, -.007]. There was no significant indirect effect of condition on violent collective action when comparing groups in the equal power condition to low-power groups in the collective autonomy support condition, *indirect effect*=-.01, *SE*=.14, 95% *CI*=[-.31, .27].

To examine the specificity for our results, we also tested if there was a significant main effect of condition on the extent to which groups described *the outgroup* being violent towards their ingroup. Specifically, we wanted to rule out the possibility that describing restrictions to the ingroup's collective autonomy promoted hostile collective action on the part of the low-power ingroup simply because it primed an overall norm of intergroup conflict. ANOVA revealed no significant main effect of condition on outgroup hostility towards the ingroup, $F(2,50)=1.63$, $p=.205$,$\eta^2=.06$. Groups in the collective autonomy restriction condition, (*M=2.85, SD*=1.49), did not differ significantly in the extent to which they described outgroup hostility towards their ingroup, relative to groups in the collective autonomy support condition, (*M*=2.00, *SD*=1.25), and the equal power condition (*M*=2.33*, SD*=1.47). Thus, it does not appear that collective autonomy restriction primed an overall norm of intergroup conflict.

Discussion

Complementing the set of studies provided in the main text, Supplemental Study 1 provides further behavioral and group-level evidence that restrictions to collective autonomy may uniquely contribute to a low-power group members' desire to pursue more power for their group, and to engage in collective action. Consistent with the findings of Study 3, groups (and individual group members) that lacked influence and scarce resources and who also had their collective autonomy restricted, had a greater desire for power relative to groups that similarly lacked influence and scarce resources but had their collective autonomy supported by the high-power group. Moreover, low-power groups who lacked influence and scarce resources and also had their collective autonomy restricted, were more likely to describe their ingroup engaging in hostile collective action towards an outgroup than low-power groups who lacked influence and scarce resources but who had their collective autonomy supported. Furthermore, mediation analyses revealed that group members' imagination of hostile collective action towards the high-power group was mediated by their desire for group power. Thus, this provides some evidence that low-power groups that have their collective autonomy restricted might engage in collective action instrumentally as a means of empowering their group.

Additionally, we explored whether low-power group members who lacked societal influence and scarce resources might *not* necessarily desire more power than groups who had equal power to other groups in their society, so long as they maintained their collective autonomy. At the group level, low-power groups who had their collective autonomy supported by the outgroup did not desire power more, or engage in hostile collective action more, than groups that had equal power as the outgroup. This provides some evidence that when low-power groups have their collective autonomy supported by the high-power group they might be more likely to tolerate other forms of disadvantage such as lacking scarce resources.

Figure S1. *Low-power (Left) and Equal-Power (Right) Stimuli Used in Supplemental Study 1 (Manuscript 2).*

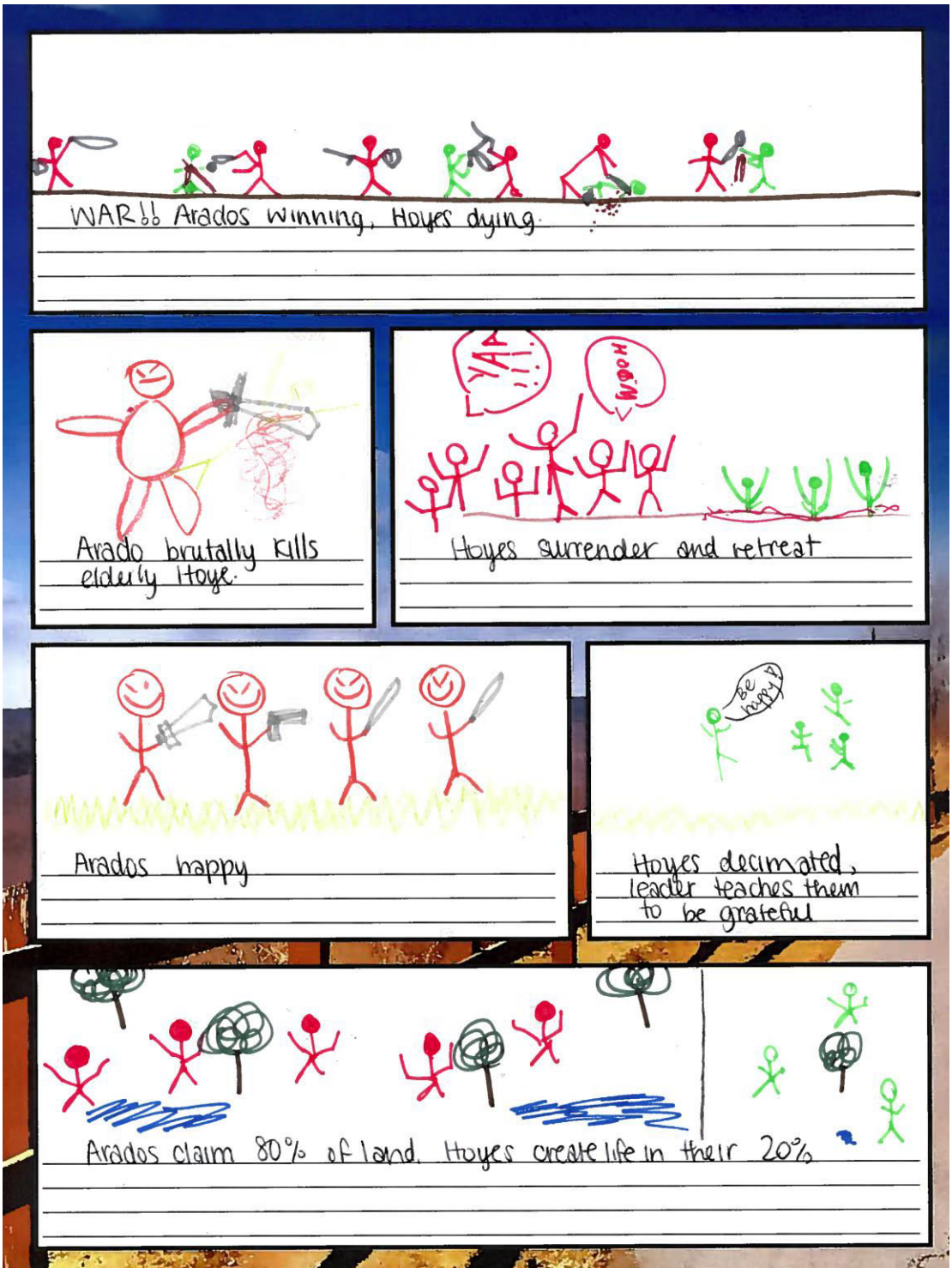


Figure S2. *Example illustration of an Intergroup Event Between the Hoye (Ingroup) and the Arado (Outgroup) from Supplemental Study 1 (Manuscript 2)*

APPENDIX D: Supplemental Materials of All Scales and Experimental Materials Used in Manuscript 2

Study 1, Manuscript 2, Materials
(Note Redundancies with Study 1, Manuscript 1)

Core Cultural Identification and Intergroup Context Identification Task

What cultural group do you identify with most?

People identify to differing degrees with different social groups. One type of social group that we belong to is a core cultural group. This is the group you refer to naturally when people ask you what your background is, and you reply "I am x". Some people may identify with broad national groups, and respond to such questions by saying "I am Canadian" or "I am Indian". Others may identify with more specific groups, such as a religious or ethnic subgroup within a broader national group and may reply in ways more like these examples: "I am a Jewish-Canadian", "I am a Canadian Jew", "I am Indo-Canadian", or "I am Quebecois". For this questionnaire we will ask you questions about your core cultural group- the cultural group you identify with most. This can be the culture of your birth, the culture in which you were raised, or another culture that forms part of your background. For some this will be easy, however for many we know that determining what your core culture can be hard to do, as you may feel that you identify with more than one culture, or no culture at all. Nevertheless, please do your best to pick the culture that you identify most strongly with, and the culture that you feel most "makes you who you are". Feel free to respond to this as naturally as you can. In the text box below the circle, write down the cultural group that you identify with the most (e.g. "Jews." "Koreans." "the Irish." "Asians." "New Yorkers." "Chinese-American.")

WE are:

What context do you see your core cultural group ({{WEare}}) In?

The social contexts that affect our cultural groups are complex and there are many of them. Different contexts will matter to different people. For example, someone who identifies with the culture in which they were born may think primarily of that immediate cultural milieu. Another

person who has immigrated from his/her homeland to live in the United States may frequently think about members of his/her culture back home in their country of origin. Another person who has immigrated from his/her homeland to the United States may think more frequently about other members of his/her culture who are also living in the United States. For other cultural groups that have experienced Diaspora you may see your group as being spread in different locations across the globe. When you answer this survey, we want you to think about your cultural group ({{ WEare }}) in the context that matters the most to you.To help you do so, here is a world map. Which geographic area do you most strongly associate with your core cultural group ({{ WEare }})? Please look at the world map to locate this area, then write down the name of this area below the map. This could be a country, a state, a province, a city, or even a community within a city. If more than one space comes to mind, feel free to write all of them in the space.

Type the name of the area(s):

What other cultural group interacts with your group the most?

In this survey, we will ask you questions about how the members of your core cultural group have interacted with other cultural groups and how your core cultural group is compared to other cultural groups. Of course the world is filled with many cultures, but we want to know about the other group that has interacted with your group ({{WEare}}) the most and has influenced your group the most. For example, an Indian may think of Pakistani people, or the British. An immigrant living in Canada may think of mainstream Canadians. To help you conceptualize this

more clearly, we would like you to fill in the shapes below. In the text box below the circle, we would like you to write the name of your core cultural group again ("Who we are"). In the text box below the rectangle, we would like you to write the name of the other cultural group that has interacted with your cultural group the most ("Who they are"). (e.g. "Jews." "Koreans." "the Irish." "Asians." "New Yorkers." "Chinese-American.")

Context Specific Power

What are the power dynamics between the two group PRESENTLY?

We want to know what the PRESENT power dynamic is between your group and the other group? Slide the cursor towards the group who PRESENTLY has the most power. The closer the cursor is to a group's name, the more power this group has. If both groups have equal power, leave the cursor at 0 (in the center of the slider).

Ideal Power

What would you want the power dynamics be between your group and the other group?
We want to know what YOU WOULD LIKE the power dynamic to be between your group and the other group. The closer the cursor is to a group's name, the more power this group would have. If you would want both groups to have EQUAL power, leave the cursor at 0 (in the center of the slider).

Context Specific Collective Autonomy Restriction

Does the other group try to control your group?
We want to know the extent to which the other group has tried to control your group? Do they try to unduly influence your group's culture - your customs, practices, values and traditions? Do they try to prevent members in your group from practicing your culture?Use the cursor to rate how much the other group has tried to control you, from 0 to 100, where "0" = "**not at all", and "100" = "very much so"**

Quality of Relations
We want to know whether or not the relations between members of your group and the other group are positive or negative? Place the cursor closer to "positive" or "negative" depending on the degree to which your group and the other group get along well. Leaving the cursor to 0 means that the quality of relations is neutral.

Variables Reported in Main Text

Collective Autonomy Scale

While answering this section, please keep in mind the people within your most identified-with cultural group, {{WEare}}, in general. Following are statements about the extent to which your group is free from the influence and control of other groups in determining its identity, with which you may disagree or agree. Please use the following 7-point scale to indicate the extent to which you agree with each of these statements. Use the following seven-point scale to indicate the extent to which you agree with each statement. There are no right or wrong answers.

1. We (*name of core cultural group*) have been free to determine our identity.
2. We () have been free to determine our customs and practices.
3. We () have been free to determine our core values and shared beliefs.
4. We () have been free to determine who we are as a people.
5. We () have been free to determine what we do as a people.
6. Other groups have tried to control us ().
7. Other groups have tried to control what we () can do.
8. Other groups have tried to control what we () should value and believe.
9. Other groups have tried to control what customs and practices we () should follow.
10. In general, other groups support the right that we () have to act in accordance with our identity.
11. In general, other groups support the right that we () have to follow our customs and practices.
12. In general, other groups support the right that we () have to act in accordance with what we value.
13. In general, other groups try to control the extent to which we () can act in accordance with our cultural identity.
14. In general, other groups try to control the extent to which we () can follow our customs and practices.
15. In general, other groups try to control the extent to which we () can act in accordance with our cultural values.
16. Other groups impose aspects of their culture onto our culture ().

Desire for Group Power
Please rate your agreement to the following statements concerning your core cultural group {{WEare}}. There are no right or wrong answers.

1. My core cultural group would like to have a greater level of control over the interactions between ourselves and other groups.
2. My core cultural group would like to have more power as a group.
3. My core cultural group would like to have more influence as a group.
4. My core cultural group would like to have more say during our interactions with other groups

System Justification (Kay & Jost, 2003)

1. Please rate your agreement to the following statements. There are no right or wrong answers.
2. In general, I find society to be fair.
3. Most policies serve the greater good.
4. Everyone has a fair shot at wealth and happiness.
5. Society is set up so that people usually get what they deserve.

Potentially Overlapping Variables Used Covariates

Discrimination
Please rate your agreement to the following statements concerning your core cultural group {{WEare}}. There are no right or wrong answers.

1. It is common that members from other groups discriminate against members of my group.
2. My core cultural group has been the target of prejudice.
3. It is rare that members of my core cultural group face discrimination.

Group Identification

We would like you to answer some questions about the core cultural group that you identified previously ({{WEare}}). There are no right or wrong answers. Please use the 7-point scale to indicate the extent to which you agree with each of these statements.

1. I identify with members of my core cultural group.
2. I see my self as being a member of my core cultural group.
3. I feel strong ties to other members of my core cultural group.
4. I am pleased to be a member of my core cultural group.

Social Dominance Orientation 7 Scale (Ho et al., 2015)

Please rate your agreement to the following statements. There are no right or wrong answers.

1. An ideal society requires some groups to be on top and others to be on the bottom.
2. Some groups of people are simply inferior to other groups.
3. Groups at the bottom are just as deserving as groups at the top.
4. No one group should dominate in society.
5. It is unjust to try to make groups equal.
6. Group equality should NOT be our primary goal.
7. We should work to give all groups an equal chance to succeed.
8. We should do what we can to equalize conditions for different groups.

Other variables assessed that are beyond the scope of the present research

1. Personal Autonomous Need Satisfaction (Sheldon & Gunz, 2009)
2. Feeling of Group Power (Shnabel & Nadler, 2008)
3. Collective Efficacy (Gibson, Randel, & Earley, 2000)
4. Personal Regulatory Style for Practicing Culture (Adapted from Chirckov et al., 2003)
5. Personal Autonomy Support from Ingroup Members (Williams et al., 1996
6. Group Distinctiveness
7. Collective Control (Tiessen, Taylor, & Kirmayer, 2009)
8. Life Satisfaction (Diener, Emmons, Larsen, & Griffin, 1985)
9. Self-actualization scale (Jones & Crandall, 1986
10. Self-Esteem (Rosenberg, 1965)
11. Depression Inventory (Radloff, 1977)
12. Alternate Version of Collective Autonomy Scale

Study 2, Manuscript 2, Materials

Main Variables Reported in Main Text

Perceived Restrictions to Collective Autonomy: The following are statements about the extent to which Black Americans have been free to determine and practice their own identity and culture. Please indicate how much you agree or disagree with the following statements. You can work quickly; your first feeling is generally best.

1. Other groups have tried to control us.
2. Other groups have tried to control what we can do.
3. Other groups have tried to control what we should value and believe.
4. Other groups have tried to control what customs and practices we should follow.
5. In general, other groups try to control the extent to which we can act in accordance with our identity.
6. In general, other groups try to control the extent to which we can follow our customs and practices.
7. In general, other groups try to control the extent to which we can act in accordance with our cultural values.
8. Other groups impose aspects of their culture on our culture.

Support for Collective Action: Please indicate how much you agree or disagree with the following statements.

1. In order for Black Americans to achieve political gains, they need to close ranks and redouble their efforts.
2. Black Americans need to stick together in order to fight against their place in the present social hierarchy.
3. Black Americans should work together to ensure progress towards changing their place in the present social hierarchy.
4. There's no point in trying to bring all Black Americans together to fight against their place in the present social hierarchy.

Support of Black Panther Party: Please look at the picture above closely and then answer the following questions using the slider ranging from 0 "Not at all" to 100 "Very much so".

1. To what extent do you agree with the message being sent by this picture.
2. Do you think Blacks Americans should push to create the social reality depicted in this picture?

System Justification: Please indicate how much you agree or disagree with the following statements.

1. In general, I find society to be fair.
2. Most policies serve the greater good.
3. Everyone has a fair shot at wealth and happiness
4. Society is set up so that people usually get what they deserve.
5. In general, the American political system operates as it should.
6. American society needs to be radically restructured.
7. The United States is the best country in the world to live in.
8. Our society is getting worse every year.

Covariates Used In Analyses

Group Identification: Please indicate how much you agree or disagree with the following statements.

1. How strongly do you identify with other members of your ethnic group?
2. How important is your ethnicity to your identity?
3. I feel a bond with other members of my ethnic group.
4. I feel solidarity with other members of my ethnic group.

System Illegitimacy: Please indicate how much you agree or disagree with the following statements.

1. White Americans deserve to be better off than Black Americans in the U.S. today (*Because of low factor loadings with other items, this item was not used in main analyses).*
2. The fact that White Americans in the U.S. are currently doing better than Black Americans is unjust.
3. I think the current balance of power between White Americans and Blacks Americans in the U.S. is unfair.

General Stability: Please indicate how much you agree or disagree with the following statements.

1. The current power dynamic between Black Americans and White Americans in the United States is just temporary.
2. The current power dynamic between Black Americans and White Americans in the United States will not change easily (*Because of low factor loadings with other items, this item was not used in main analyses).*

System Permeability : Please indicate how much you agree or disagree with the following statements.

1. For a Black American, it is nearly impossible to be regarded in the same way as a White American. (*Because of low factor loadings with other items, this item was not used in main analyses).*
2. If a Black American just worked hard enough, it would be easy for them to be fully accepted by Whites.
3. In America, it is not hard to climb up the social hierarchy if you put your mind to it.

Ingroup Bias (Feeling Thermometer)

1. Please rate how cold or warm you feel toward Blacks (0 = coldest feelings, 50=neutral, 100 = warmest feelings)

2. Please rate how cold or warm you feel toward Whites 0 = coldest feelings, 50=neutral, 100 = warmest feelings).

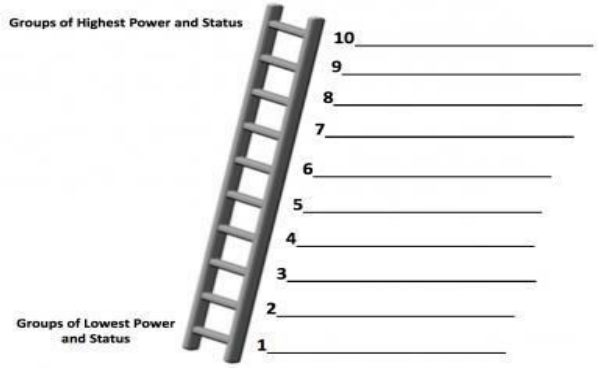
Social Dominance Orientation

1. An ideal society requires some groups to be on top and others to be on the bottom.
2. Some groups of people are simply inferior to other groups.
3. Groups at the bottom are just as deserving as groups at the top.
4. No one group should dominate in society.
5. It is unjust to try to make groups equal.
6. Group equality should not be our primary goal.
7. We should work to give all groups an equal chance to succeed.
8. We should do what we can to equalize conditions for different groups.
9. Some groups of people must be kept in their place.
10. It's probably a good thing that certain groups are at the top and other groups are at the bottom.
11. Groups at the bottom should not have to stay in their place.
12. Group dominance is a poor principle.
13. We should NOT push for group equality.
14. We shouldn't try to guarantee that every group has the same quality of life.
15. No matter how much effort it takes, we ought to strive to ensure that all groups have the same chance in life.
16. Group equality should be our ideal.

Variables Reported in Supplemental Analyses

Social Ladder Measure

Imagine that a ladder can be used to visually represent where different groups stand in the United States. The top of the ladder represents groups that are the best off- those that have the most power, the most resources, and the most respect. At the bottom are the groups that are the worst off – they have the least power, the least resources, and the least respect. In the following questions we will ask you some questions about where you think White Americans and Black Americans stand on this ladder.



We would like to know where you think that Black Americans and White Americans ACTUALLY STAND PRESENTLY on the social ladder in the United States. Please use the sliders to indicate where you think that Black Americans and White Americans actually stand presently in the United States, where the LEFT most position on the slider represents "the lowest rung" and RIGHT most position indicates the highest rung.

_____ Where do BLACK AMERICANS stand presently?
_____ Where do WHITE AMERICANS stand presently?

Now, we would like you use this ladder to indicate how you would WANT Black Americans and White Americans to stand in the United States IN AN IDEAL WORLD. Please use the sliders to indicate where you think that Black Americans and White Americans should ideally stand in the United States, where the LEFT most position on the slider represents "the lowest rung" and RIGHT most position indicates the highest rung.

_____ Where would you have BLACK AMERICANS stand in an ideal world?
_____ Where would you have WHITE AMERICANS stand in an ideal world?

Other scales included in the survey for other projects that are beyond the scope of the present research

1. Personal Autonomous Need Satisfaction (Sheldon & Gunz, 2009).
2. Ingroup dominance
3. Desire to create an egalitarian America.
4. Blatant dehumanization of Whites by Blacks.
5. Perceived police brutality.
6. Sense of shared reality with other Black group members.
7. Conservatism.
8. Self-sacrifice for Black ingroup.
9. Machiavellianism
10. Meta-dehumanization
11. Hostility towards Whites
12. Support for redistribution of wealth to Blacks
13. Affirmative action support.
14. Muscle size
15. Empathy

Study 3, Manuscript 2, Materials
(Note there is overlap with Study 2, Manuscript 1)

Verbal Manipulations used when Informing the Ingroup of the Outgroup's Decision for How to Use its' Power

Control Condition: "*The other group wasn't too sure whether or not they wanted to stay in their room or switch with you. They were divided, but in the end they decided to stay in their room."*

Collective Autonomy Restriction Condition: "*The other group weren't too sure whether or not they wanted you to keep your own coat of arms design. They were divided, but in the end they decided to modify your coat of arms."*

Collective Autonomy Support Condition: "*The other group weren't too sure whether or not they wanted you to keep your own coat of arms design. They were divided, but in the end they decided not to make any changes to your coat of arms."*

Written Instructions of Background Information and Study Explanation used in Year 1

Even among our most ancient civilizations, humans have used images of animals and nature, and the various colors that appear in our natural environment to symbolize their personal, family and tribal identities. This was a common practice among the people of ancient Israel, Greece, Egypt and the Aboriginal peoples of North America.

The utilization of colours and pictures to symbolize group identity was formalized into the practice of *armory* during the eleventh century in Europe. Armory can be defined as the practice of using distinctive figures and colours on weapons and shields as a means of identification. In medieval Europe the *coat of arms* was a symbol of a family's heritage. The coat of arms has since become associated with larger groups. For example, military units, provinces and countries still use them.

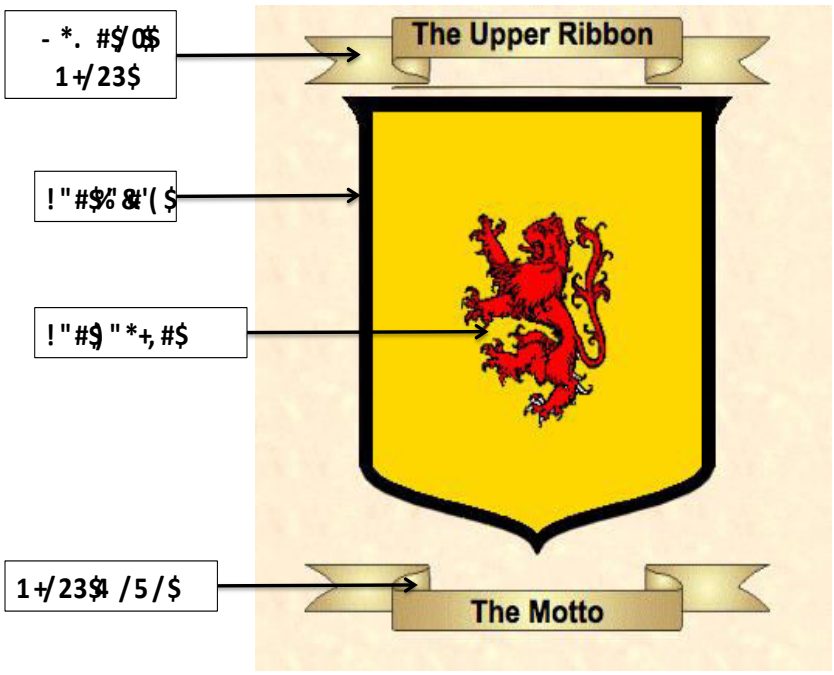
The practice of armory follows a set of established rules and laws in which the different symbols, components, and colours that appear on the coat of arms represent the specific values and traits that make up a group's identity. By combining these colours and symbols, people can represent their group's distinctive identity. Armory has even been considered a *science* by some scholars in which "the rules and the laws govern the use, the display, meaning, and knowledge of the pictured signs and emblems appertaining to shield" (Fox-Davies, 1909, p.1).

Coat of Arms Components

One of the most important components of the coat of arms is the shield. It is on the shield where the colours and charges that symbolize a group's identity appear. In medieval times, knights would wear their shield on their arm, so that their allies could identify them in battle.

Two important features of the shield are the colour of the shield and the charge that appears on it. They symbolize the values and traits that are most central to the group identity being represented.

Another important feature of the coat of arms is the Motto that appears beneath the shield. The motto is a phrase that states the basic philosophy of the family or group. As well, the coat of arms may contain an Upper Ribbon that displays the name of the group.
Below is a picture illustrating the components of a Coat of Arms:



Today's Study

In today's study you and the other members of you group will play an interactive multiplayer role playing game on the computer called Group Quest. The objective of the game is for your group to complete as many group quests as fast as you can! However, before you begin you will first discuss as a group what it means to be part of your group. In other words, you will develop an identity for your group. Forming a group identity is essential to being able to perform well as a group. This involves determining what you and your group members value collectively, and the distinct characteristics, traits and practices that you all share. These are the unique attributes that make you a meaningful group. To do this, you will create your own coat of arms that represents your own distinct group identity.

As you create your group identity, think wisely about what values and traits you all share together as a group. Depending on the values and attributes that you and your group define as being characteristic of your group identity, the unit which you will control in Group Quest will have different abilities and special characteristics. In other words, your group coat of arms will have a direct impact on how you will play the Group Quest game! While all combinations of charges and colors will provide a different experience in the game, the overall advantage of any combination is the same!

Creating Your Group Coat of Arms

You and your group members will use the interactive coat of arms program to create a coat of arms for your group. This involves determining the 5 key components of your coat of arms.

1) Shield Color - This symbolizes the values of your group.

2) Group Charge- This symbolizes the common traits that you share with the other members of your group.

3) Charge Color- This also symbolizes the values of your group.

4) Group Name - This is what your group will be known as.

5) Group Motto - The basic philosophy of one's group identity

Instructions for Using the Coat of Arms Generator

1. Select a shield colour, charge, and charge colour for your coat of arms.
2. Click "Generate Coat of Arms Preview" to see a preview of your group's coat of arms.
3. When you have finished creating your group coat of arms you can select the "Finalize Coat of Arms" button to finalize your group coat of arms.
4. Let the experimenter know that you are finished so that he/she can print out your group's coat of arms!

Video Instructions of Background Information and Study Explanation Used In Year 2

Welcome to Group Quest. We have prepared audio instructions to tell you all about today's study.

The purpose of today's experiment will be for you all to complete an interactive multiplayer computer game called Group Quest. Your goal will be to beat all the quests as fast as you can!

However, before you play the game, you will be able to form a group identity for your group. Studies have found that forming a group identity is essential for group members to be able to perform well together as a group. To form your group identity you will create a coat of arms!

Before we show you how to do this, let's first take a moment to go over a brief history of coats of arms.

Even amongst our most ancient civilizations, humans have used images of animals and nature, as well as the various colors that appear in our natural environment to symbolize their personal, family and tribal identities. This was a common practice among the peoples of ancient Israel, Greece, Egypt and the Aboriginal peoples of North America.

Using colours and pictures to symbolize group identity was formalized into the practice of *armory* during the eleventh century in Europe. Armory is the practice of using distinctive figures and colours on weapons and shields as a means of identification. In medieval Europe the

coat of arms was a symbol of a family's heritage. The coat of arms has since become associated with larger groups. For example, military units, provinces and countries still use them.

The practice of armory follows a set of established rules and laws in which the different symbols, components, and colors that appear on the coat of arms represent the specific values and traits that make up a group's identity. By combining these colors and symbols, people can represent their group's distinctive identity. Armory has even been considered a *science* by some scholars in which "the rules and the laws govern the use, the display, meaning, and knowledge of the pictured signs and emblems appertaining to shield"

What are the components of a coat of arms?

One of the most important components of the coat of arms is the shield. In medieval times, knights would wear their shield on their arm, so that their allies could identify them in battle. Two important features of the shield are the color of the shield and the charge that appears on it. They symbolize the values and traits that are most central to the group identity being represented.

Another important feature of the coat of arms is the Motto that appears beneath the shield. The motto is a phrase that states the basic philosophy of the family or group. As well, the coat of arms may contain an Upper Ribbon that displays the name of the group.

In today's study, the importance of forming your group identity goes beyond getting to know each other. The identity that you form will have an impact on *everything you do in Group Quest*.

Depending on the values and attributes that you and your group choose, the unit which you will control in Group Quest will have different abilities and special characteristics. In other words, your coat of arms will have a direct impact on how you will play the Group Quest game! While all combinations of charges and colors will provide a different experience in the game, the overall advantage of any combination is the same! Think carefully about what values and traits you all share together as a group as you create your arms.

(Explanation Given To Participants Assigned to the Collective Autonomy Support or Collective Autonomy Threat Conditions)

For the purpose of our study, we need one of the two groups to be able to review the other group's coat of arms and make changes to their coat of arms if they choose.

At the beginning of the experiment, your group picked one of two envelopes out of the hat. The message contained in your envelope will tell you whether your group gets to look at the other group's coat of arms, or whether the other group has this ability. If the winning group dislikes the other group's coat of arms, they are allowed to make changes to it.

The experimenter will now open the envelope and show you its contents.

(Explanation Given To Participants Assigned to the Collective Autonomy Support or Collective Autonomy Threat Conditions)

For the purpose of our study, we need one of the two groups to be able to decide where they would like to play Group Quest, right before the game starts.

At the beginning of the experiment, your group picked one of two envelopes out of the hat. The message contained in your envelope will tell you whether your group gets to decide in which room they want to play GroupQuest, or whether the other group has this ability. If the winning group dislikes the room to which they have been assigned, they are allowed to switch rooms with the other group before playing the video game.

The experimenter will now open the envelope and show you its contents.

Variables Reported in Main Text Analyses

Collective Autonomy
The following questions pertain to how you feel that your group was treated by the other group partaking in the study when you created your Coat of Arms and determined your group's identity. You may disagree or agree with these statements and there are no right or wrong answers. Please use the following 7-point scale to indicate the extent to which you agree with each of these statements on a scale of 1 "strongly disagree" to 7 "strongly agree".

1. We were free to determine our own group identity.
2. We were free to determine what attributes we share as a group.
3. We were free to determine what values we share as a group.
4. The other group pressured our group to adopt values that were not our own.
5. The other group imposed things onto our group's identity.
6. The other group told our group what we could and could not do.
7. We were able to determine our own group identity - we determined who we are as a group.
8. We felt that we could make decisions about our group's identity independently from the other group.
9. We felt pressured by the other group.
10. We felt controlled by the other group.
11. We were able to decide our group's actions- we determined what we did as a group.

Desire for Group Power (Shnabel & Nadler, 2008):
On a scale of 1 to 7, how much do you agree with the following statements?

1. During this study, our group would have liked to have had more influence as a group.
2. During this study, our group would have liked to have had more say during our interactions with the other group.
3. During this study, our group would have liked to have had a greater level of control over the interactions between ourselves and the other group.
4. During this study, our group would have liked to have had more power as a group.

Feeling of group strength (Shnabel & Nadler, 2008): On a scale of 1 to 7, how much do you agree with the following statements?

1. During the study we felt relatively strong as a group.

(Please note that we also included the following other items pertaining to group agency, however we did not combine these with perceptions of group strength because they potentially overlapped with collective autonomy and having power as a group.

1. During the study we had a lot of control over what we did.
2. During the study we had a lot of influence on what we did.

Group identification scale *(*9 items – Cameron, 2004 – included both years): Below are statements regarding how you felt during the study as a member of your group. You may disagree or agree with these statements and there are no right or wrong answers. Please use the following 7-point scale to indicate the extent to which you agree with each of these statements on a scale of 1 "strongly disagree" to 7 "strongly agree".

1. I felt strong ties to the other members of my group .
2. I found it difficult to form a bond with the other members of my group.
3. I didn't feel good about being a member of my group.
4. I had a lot in common with the other members of my group.
5. Being a member of my group had very little to do with how I felt about myself.
6. In general, I was glad to be a member of my group.
7. During the study, being a member of my group was an important part of my self-image.
8. I felt good thinking about myself as a member of my group.
9. During the study, I often thought of myself as a member of my group.

List of Additional Measures Included in Study 3, Manuscript 2, that are Beyond the Scope of the Present Research

1. Group Identification During Game Play (assessed at T=7, 14, and 21 minutes ; included during both years).
2. Feelings of Pressure During Game Play (assessed at T=7, 14, and 21 minutes ; included year 2 only).
3. Feeling of Positive Affect During Game Play (assessed at T=7, 14, and 21 minutes ; included year 2 only)
4. Personal Autonomy (Sheldon & Gunz, 2009; assessed during both years).
5. Intrinsic Motivation Felt When Creating Coat of Arms (Intrinsic Motivation Inventory – e.g., Tsigilis, & Theodosiou, 2003, included both year).
6. Intrinsic Motivation When Playing Group Quest (Intrinsic Motivation Inventory – e.g., Tsigilis, & Theodosiou, 2003, included both years).
7. Measure of Collective Autonomy which *does not* make reference to the outgroup (For student honors thesis; second half of year 1 only).
8. Self-report scale of enjoyment when playing Group Quest and Controlling the Ingame Avatar (Second year only).
9. Free choice paradigm and follow-up questions to assess intrinsic motivation to play Group Quest (Year one only).

10. Wellbeing Assessed Via Positive Affect and Self-Esteem (included Year 1 only)
11. Outgroup Bias: Hypothetical scenario assessing how group members would divide 100 dollars between their group and the outgroup (Year 1 only).
12. Outgroup Hostility/Retaliation: Series of hypothetical vignettes assessing behavior intent to retaliate towards the outgroup (For honors thesis: year 2 only).
13. Perception of size of coins (For honors thesis: used as an implicit measure of need for personal power; year 2 only).
14. Subjective perceptions of the room in which participants engaged in the study (For honors thesis: both years).
15. Participants' subjective memory of the shade of colors depicted in the coat of arms generator (For student honors thesis; Year 2 only).
16. Group Distinctiveness (Measured during Year 1 only)

Study 4, Manuscript 2, Materials

Verbal Scripts and Protocol Used by Experimenters to Conduct Study 4

Introduction to all participants: "Hi, welcome to the group quest study. Today's study will involve working in small groups of three to four people. As you can see, we are more than that number of people so we need to break you up into three groups. To do this you will draw slips out of this hat. You will draw a slip with a A, B, or C on it. The other important thing to note is that on each slip you will see a P and then a number. This is your participant ID number that you will write on all your questionnaires so that your data remains anonymous. "If your slip has a A on it follow…."

(Each group will follow one of the three experimenters into one of three separate experimental rooms.)

Instructing participants to provide consent and fill out pre-measures used in study: "Before we begin, we need you to read over and sign this consent form indicating that you agree to participate in this study. We will pass out two copies. You only need to fill out one copy and the other is for your records if you would like to keep it. Once you have done that we want you to fill out all the questions in this packet and remember to write your participant ID on it."

(Experimenter hands 2 copies of consent form to participant and then pre-measures.)

Power assignment and identity formation "We will now ask you to work together to form a group identity. We have a video to for you to watch that will explain how to do this and explain the background of the study and tell you more about the world of Grabodia. Please watch and listen to this video carefully."

(Experimenter plays the first video. Once the video terminates the experimenter briefly summarizes the key points of the video.)

"So as you heard in the video, you belong to the Hoye group. The other two groups are the Arado and the Suebla, and the Arado have the power crystal. I'll show you how to use the Coat of Arms program (*explain how program works).* After you create your coat or arms you will select your group's national food and customary greeting/gesture from the custom sheet (*hand identity formation sheet)*. Keep in mind there will be food involved in the experiment so pick something you would want to eat. Once you have finished this or if you have any questions you can come get me in the hallway."

(Experimenter leaves room)

Experimental Manipulations: *Once participants complete the identity formation task the experimenter returns into the room. The experimenter first prints out the coat of arms and then says the following:* "Now, we will play the video which explains the next part of the experiment".

(The experiment will then say the following depending on condition)

"As the video explained, the Arado will determine how many beads each group will be responsible for sorting in each round.

- **For work inequality:** There will be a total of 120 beads to be sorted in each round.
- **For work equality:** There will be a total of 180 beads to be sorted in each round.

Furthermore, as the video explained, the Arado can regulate how each group practices their culture. We will show them your coat of arms, your chosen food, and your chosen gestures. We'll then ask them if they want to make any changes to these aspects of your culture."

(*The experimenter then leaves the room to retrieve the materials and food needed for the work task and then returns after having ostensibly spoken to the high-power group. What the experiment says next will vary depending on condition).*

- **For CA support: "**Ok, we asked the Arado if each group could practice their culture. They decided that your group and the Suebla can practice your culture during the experiment. Here is your chosen food. Also, you can feel free to practice your chosen custom when you begin and end each round."
- **For CA Restriction: "**Ok, we asked the Arado if each group could practice their culture. They decided to regulate the extent to which your group and the Suebla can practice your culture. They made these changes to your coat of arms. They also decided to provide you with this food, and said that you should engage in the _____ custom when you begin and end your work rounds. They also decided to change the culture of the Suebla."
- **Work Inequality: "**For the first work round the Arado decided that your group should sort **60** beads. They also want the Suebla to sort **60**. And the Arado chose **not to sort any beads this round**."
- **Work Equality: "**For the first work round the Arado decided that each group should sort **60 beads."**

Transition to the Second Round of Work: *Once the group completes the first work round the experimenter says the following.*

"Ok, great – the other groups have finished also – we can start the next round, I'll go ask the Arado what they want to do for this round."

(*The experimenter leaves the room for 1 minute to ostensibly ask the high-power group how many beads they would like each group to sort during the second round. The experimenter then re-enters and says the following).*

- **Work Inequality:** "For the second work round the Arado decided that your group should sort again sort 60 beads. They also want the Suebla to sort 60 beads again. And the Arado chose not to sort any beads again this round."

- **Work Equality:** The Arado again decided that each group should sort 60 beads.

Individual Questionnaire (*After the group finishes the second round the experimenter re-enters and says the following).*

"Ok – a sufficient amount of mana beads have now been sorted to power Grabodia. Next – we ask that you fill out a brief **paper survey** about your impressions of the experiment so far"

(The experimenter has each participant each individually complete a measure of collective action support and system justification).

Communication to Other Groups (Beyond Scope of the Present Research): After participants completed their individual questionnaire they were provided the option of writing a letter to either the high-power Arado outgroup or the other low-power Suebla group. This data was beyond the scope of the present research and will be used to examine coalition formation between low-power groups.

Group Questionnaire: Once participants completed the letter, the experimenter provided them with the same questionnaire they completed individually. This time however, the participants completed one questionnaire as a group.

Second Phase of Experiment (Beyond Scope of Present Research): After the work task, there was a distinct second phase of the experiment testing different hypotheses unrelated to the first phase of the experiment.

Final Questionnaire: In a final questionnaire at the very end of the experiment, participants individually completed some last questions about their impressions of the experiment. This survey included our manipulation checks.

Content of Explanatory Videos Used in Study 4

Video 1 – Introduction + Identity Formation

Welcome to the Group Quest Study and the world of Grabodia. We have prepared audio instructions to tell you all about today's study.

The purpose of today's experiment will be for you to complete interactive group tasks so that we can study the dynamic processes of intragroup and intergroup relations.

To study these processes, we want you to imagine that you are a descendent of another group of people known as the Grabodians. The Grabodians inhabit the far off planet of Grabodia which has many parallels to the planet earth. You can picture the geographical landscape and climate of Grabodia as being very similar to that of the planet Earth. As such, the Grabodian people have been evolving on Grabodia under very similar conditions to what humans have evolved under on Earth. On Grabodia there are THREE DIFFERENT GROUPS OF GRABODIANS: THE HOYE,

THE ARADO, and THE SUEBLA. We know that the three groups often interact, but we don't know much about the precise nature of these interactions.

Please flip over the piece of paper next to the computer in front of you to see what group you are a part of!

Brief pause so the participants can see what group they belong to

On Grabodia there exists an ancient power crystal that gives off large amounts of natural energy. The Arado group has had possession of the power crystal for many years. As a result, the Arado group has over the years had a great deal of power over the structure of life on Grabodia. In today's study, there will be a number of group tasks and decisions about these tasks that need to be made. Individuals who belong to the *ARADO group will make these decisions.* If you instead belong to the Hoye group or the Suebla group will receive directions from the Arado group.

Before beginning these group tasks however, each of your groups will form a meaningful group identity. You will create an identity for your group in three different ways:

This will Involve:

- Creating a group Coat or Arms
-Determining the cultural food of your group
-Selecting a custom for your group

Before we show you how to do this, let's first take a moment to go over a brief history of coats of arms.

Even amongst our most ancient civilizations, humans have used images of animals and nature, as well as the various colors that appear in our natural environment to symbolize their personal, family and tribal identities. This was a common practice among the peoples of many ancient civilizations.

Using colours and pictures to symbolize group identity was formalized into the practice of *armory* during the eleventh century. Coats of arms use distinctive figures and colours as a means of identification. Originally coats of arms were used to symbol a family's heritage. The coat of arms has since become associated with larger groups. For example, many provinces and countries still use them.

The practice of armory follows a set of established rules and laws in which the different symbols, components, and colours that appear on the coat of arms represent the specific values and traits that make up a group's identity. By combining these colours and symbols, people can represent their group's distinctive identity.

What are the components of a coat of arms?

One of the most important components of the coat of arms is the shield. Two important features of the shield are the colour of the shield and the charge that appears on it. They symbolize the values and traits that are most central to the group identity being represented.

Another important feature of the coat of arms is the Motto that appears beneath the shield. The motto is a phrase that states the basic philosophy of the family or group. As well, the coat of arms may contain an Upper Ribbon that displays the name of the group.

Think carefully about what values and traits you all share together as a group as you create your coat of arms, as your coat of arms will represent your culture and identity as a group!

Beyond having symbols that represent your shared traits and values as a group, it is also important to have cultural food. For example, even the earliest civilizations have left traces of their own distinctive food. In today's study you will be able to choose between six different foods In terms of food, your group can decide whether you national food is: "cookies" "chocolate," "chips," "vegetables," "fruits," or "seeds".

It is also important to have group customs. Like food, greeting customs can be traced back to our earliest civilizations. In today's study, you will be able to choose between different greeting customs to determine the custom that represents your group's culture. During the study, your group will be able to perform the greeting custom you select.

Instructions for how to create your coat of arms and choose your food and customs will be provided to you by the experimenter.

Video 2 – Work Task

One important part of life on Grabodia is for the three groups to ensure that they can obtain enough energy to power their homes, factories, and Grabodian transportation units. Beyond the power crystal that is controlled by one group on Grabodia, the basic and common source of energy on Grabodia are **mana beads**.

Mana-beads are light grey beads that can be found in the Grabodian quarries. However, mana-beads are mixed among unstable "dark energy beads" which look similar to the mana-beads. Dark energy beads look similar to manna beads, but are a much darker shade of grey. These dark energy beads can explode and cause great damage if used accidently to generate power. Thus, Grabodians must pay careful attention and care when sorting and collecting the light grey mana-beads from the unstable dark energy beads.

Now, your three groups will spend time collecting mana-beads in order to power Grabodia. During each work round, your three groups will have to sort out a certain number of light grey mana-beads from the dark energy beads. Because the Arado group has the power crystal, members of the Arado group will have the ability to decide how many mana-beads each group will be responsible for sorting in each round. The round will last for as long as it takes for all groups to contribute their assigned number of beads for that round. If your group finishes before

the other groups, you will be able to relax and talk to your group members, or play some games that we have loaded on the computers.

It is customary for Grabodians to eat food while they do their work. As well, it is customary for Grabodians to begin and end each work round with their customary greeting. The high power Arado group has the power to determine what cultural practices are permissible on Grabodia. Thus, the Arado group will look over the customary food and customary greeting selected by each the Hoye and the Suebla, and will then decide if each group can keep its culture or should eat food and use greetings that are different from what they selected initially.

Variables Reported in Main Text Analyses

Individual Questionnaire: Instructions: Respond to each question based on your experiences in the study so far, and by imagining that you really are living on Grabodia.

Collective action support:

1. My people need to act in solidarity in order to improve how we are treated on Grabodia.
2. My people need to stick together and act collectively.
3. My people need to come together and fight against the injustices on Grabodia.
4. We need to "stand up" against unfair policies on Grabodia, to ensure that our rights as a people are respected.
5. We need to rise up together to ensure that we are not pushed around.

System Justification Support:

1. In general, Grabodian society is fair.
2. Grabodian society needs to be radically restructured.
3. Most policies on Grabodia serve the greater good.
4. Grabodian society is set up so that people usually get what they deserve.

Group Level Questionnaire: Instructions: Respond to each question based on your experiences in the study so far, and by imagining that you really are Hoye people living on Grabodia.

Collective Action Support:

1. Our people need to act in solidarity in order to improve how we are treated on Grabodia.
2. Our people need to stick together and act collectively.
3. Our people need to come together and fight against the injustices on Grabodia.
4. We need to "stand up" against unfair policies on Grabodia, to ensure that our rights as a people are respected.
5. We need to rise up together to ensure that we are not pushed around.

System Justification:

1. In general, Grabodian society is fair.
2. Grabodian society needs to be radically restructured.

3. Most policies on Grabodia serve the greater good.
4. Grabodian society is set up so that people usually get what they deserve.

Collective Autonomy Manipulation Check: Please indicate how much you agree or disagree with the following statements, thinking about what the experiment was like when the ARADO Group had control of the power crystal. Please base your responses assuming that your experiences in this study are representative of what life is like on Grabodia.

1. I felt that my Hoye people could maintain our cultural customs and practices when the Arado group was in power.
2. I felt that my Hoye people were prevented from practicing our culture when the Arado group was in power.

Equality Manipulation Check: Please indicate how much you agree or disagree with the following statements, thinking about what the experiment was like when the ARADO Group had control of the power crystal. Please base your responses assuming that your experiences in this study are representative of what life is like on Grabodia.

1. I felt that my people were taken advantage of when the Arado were in power.
2. I felt that my people were exploited when the Arado were in power.

List of Additional Variables Assessed in Study 4, that are Beyond the Scope of Present Research

Pre-Measures

1. Social Dominance Orientation
2. Ingroup Dominance
3. Regulatory Style for Identifying with Social Groups
4. Individual differences in assertiveness
5. Baseline measures of hunger, positive and negative affect
6. Baseline interest in video games / role playing games

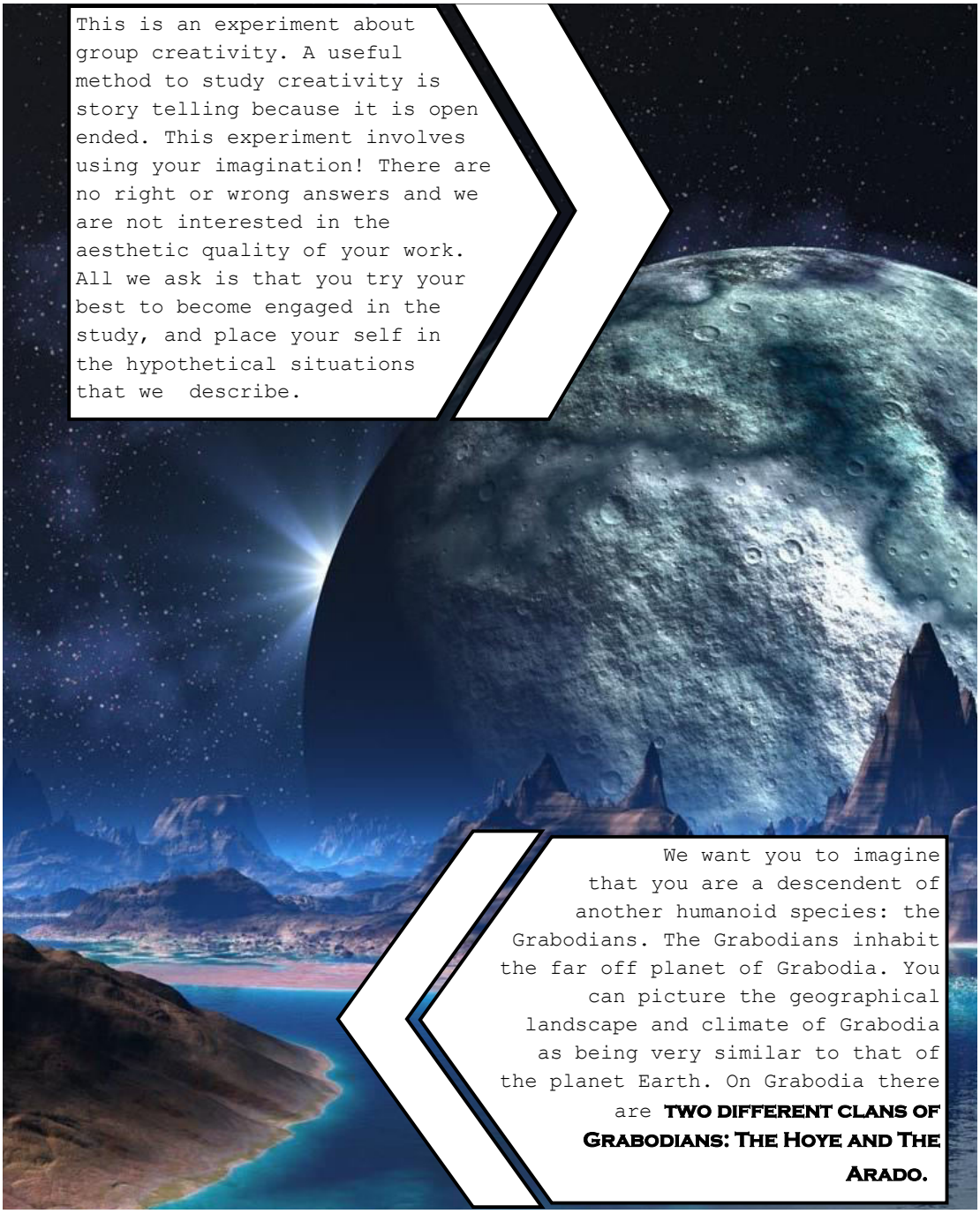
Final Online Questionnaire

1. Group identification
2. Ingroup bias (difference on feeling thermometer)
3. Hostile emotions towards both outgroups
4. Turst/common bond felt towards both outgroups
5. Categorization of outgroups as distinct groups
6. Feeling of group power
7. Perceptions of other ingroup members as suitable leaders

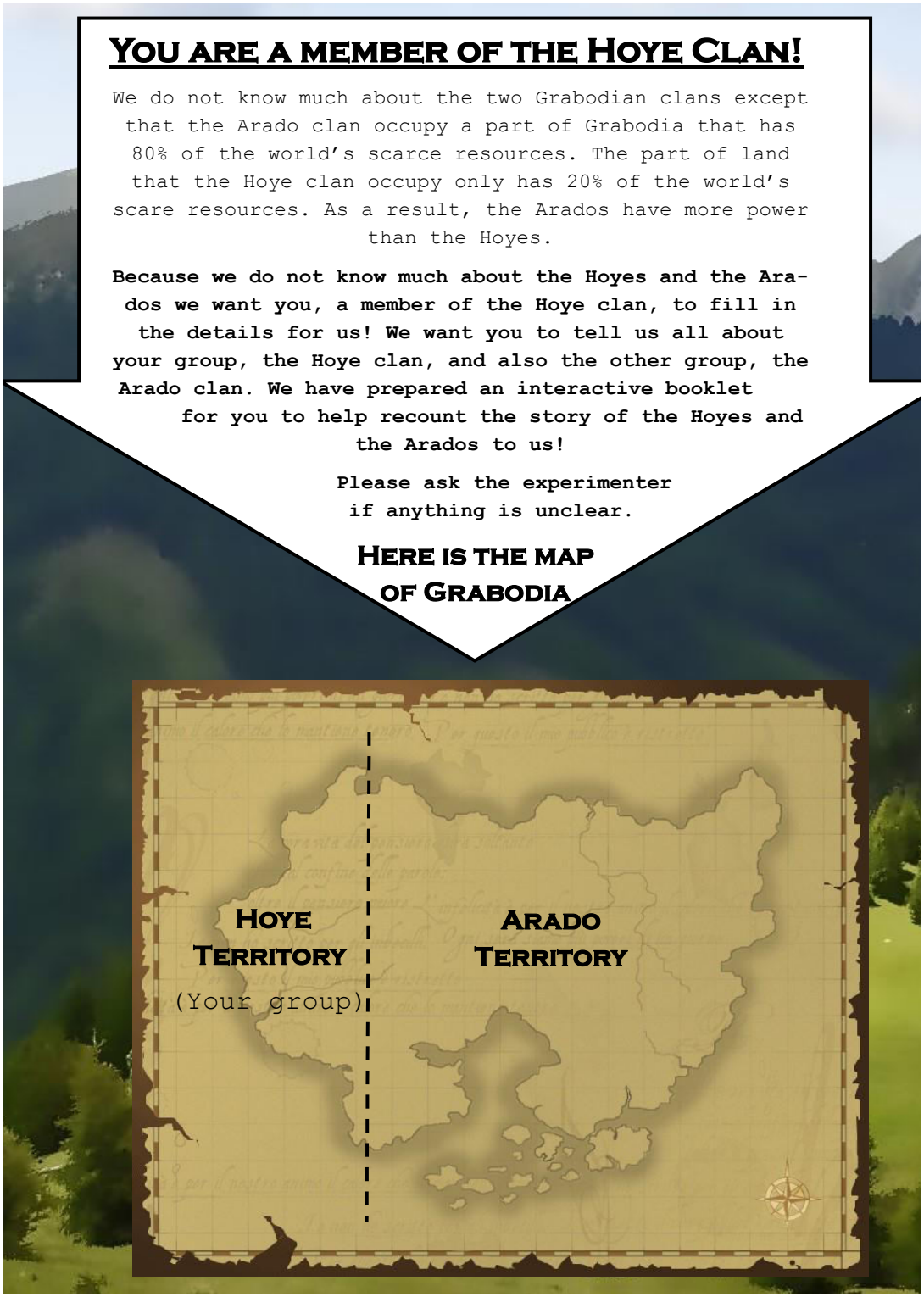
Supplemental Study 1, Manuscript 2, Graphic Novel

Graphic Novel Questionnaire (We only provided pages of the novel that were used in the present research. The entire graphic novel is available upon request).

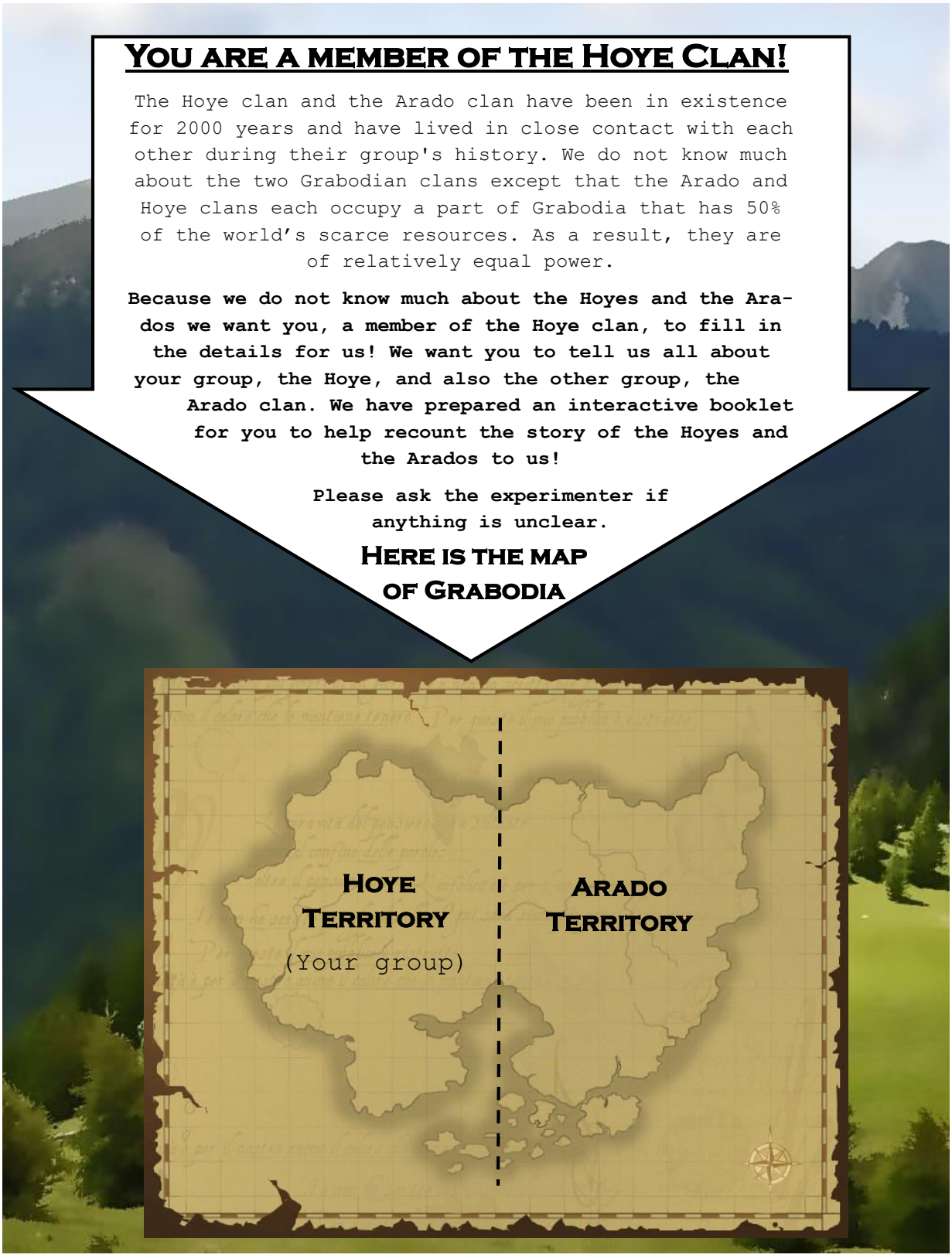
Introduction Page



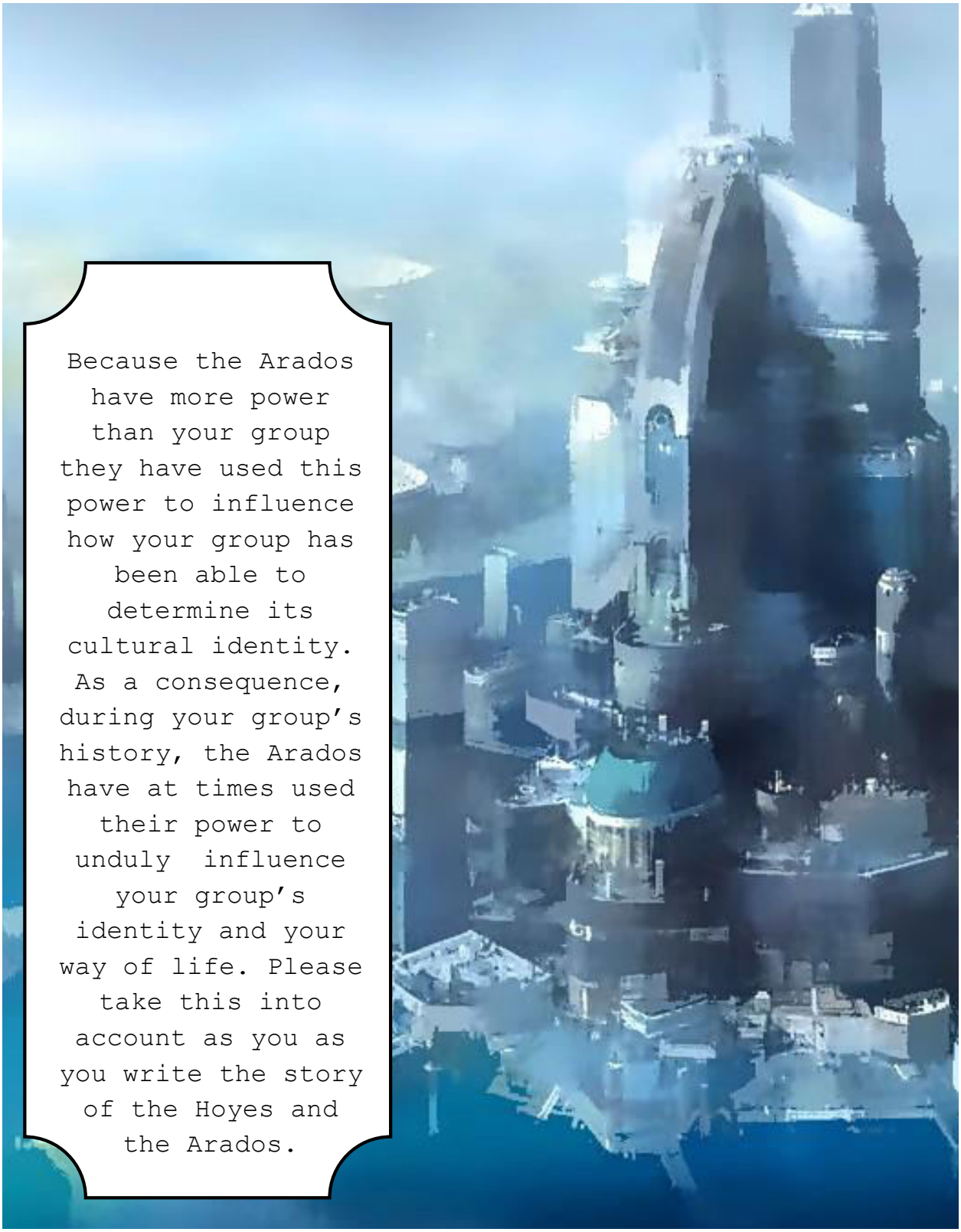
Low-Power Page (Shown to those in the collective autonomy support and collective autonomy restriction conditions)



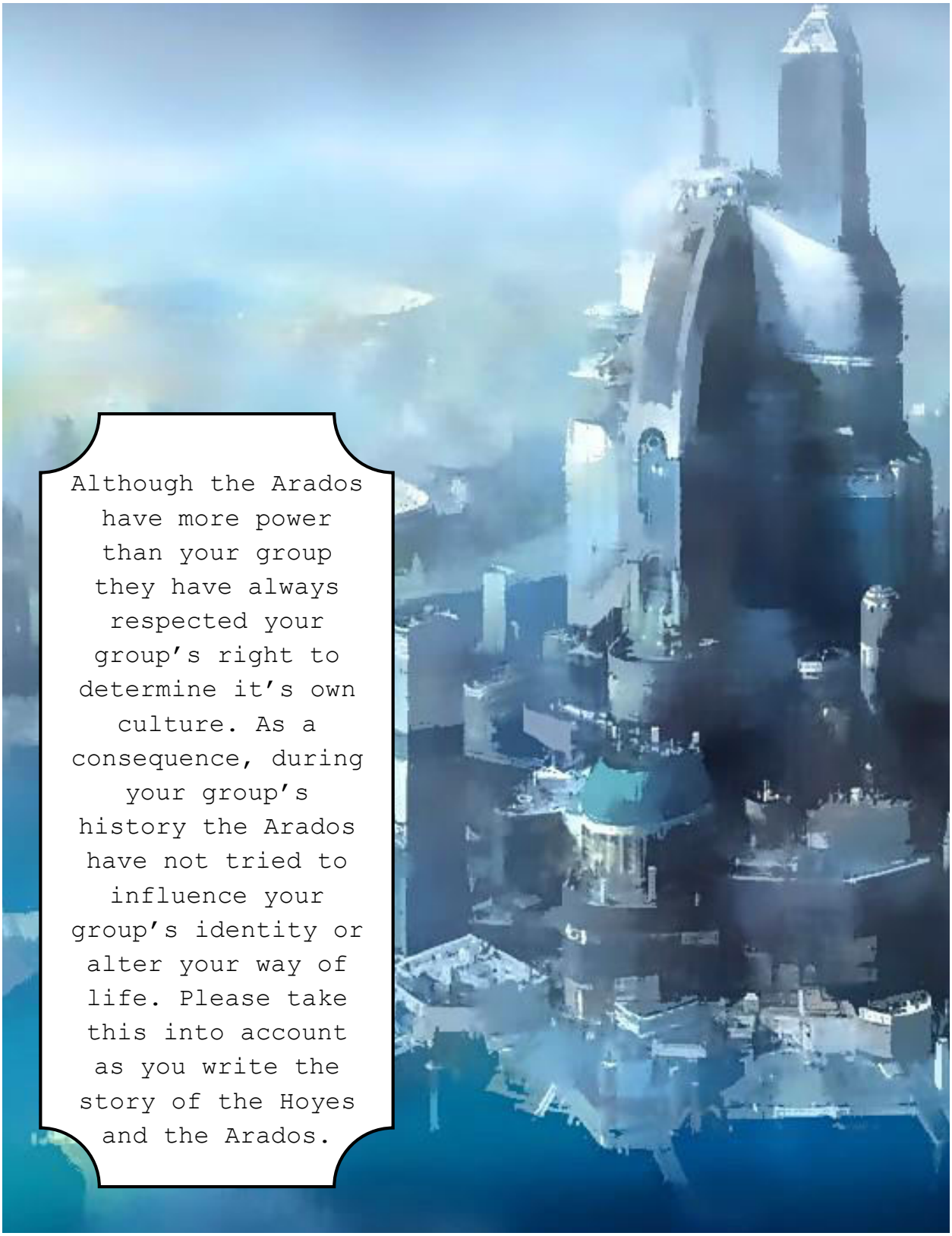
Equal Power Page (Shown to those in the equal power condition)



Collective Autonomy Restriction Manipulation

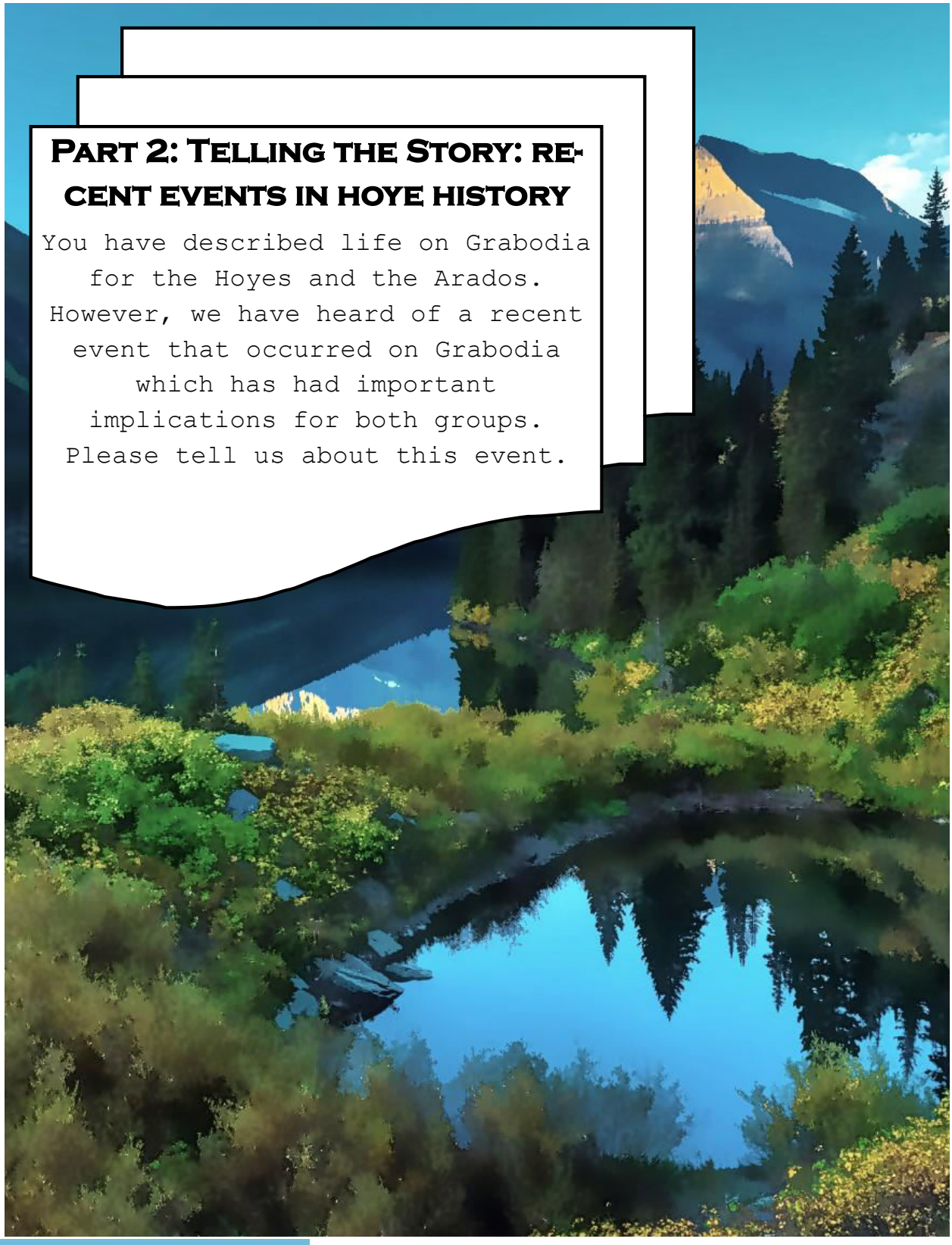


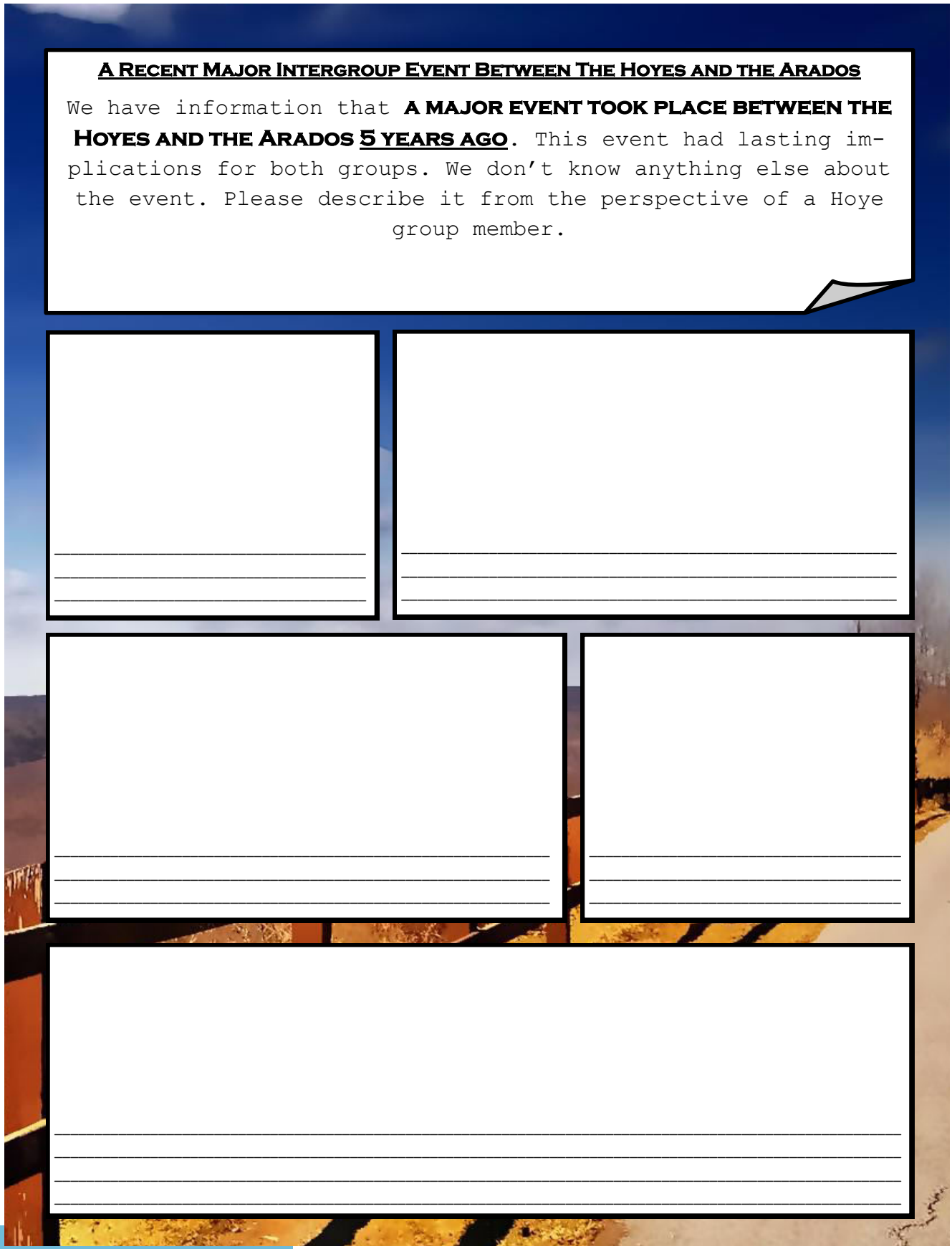
Collective Autonomy Support Manipulation

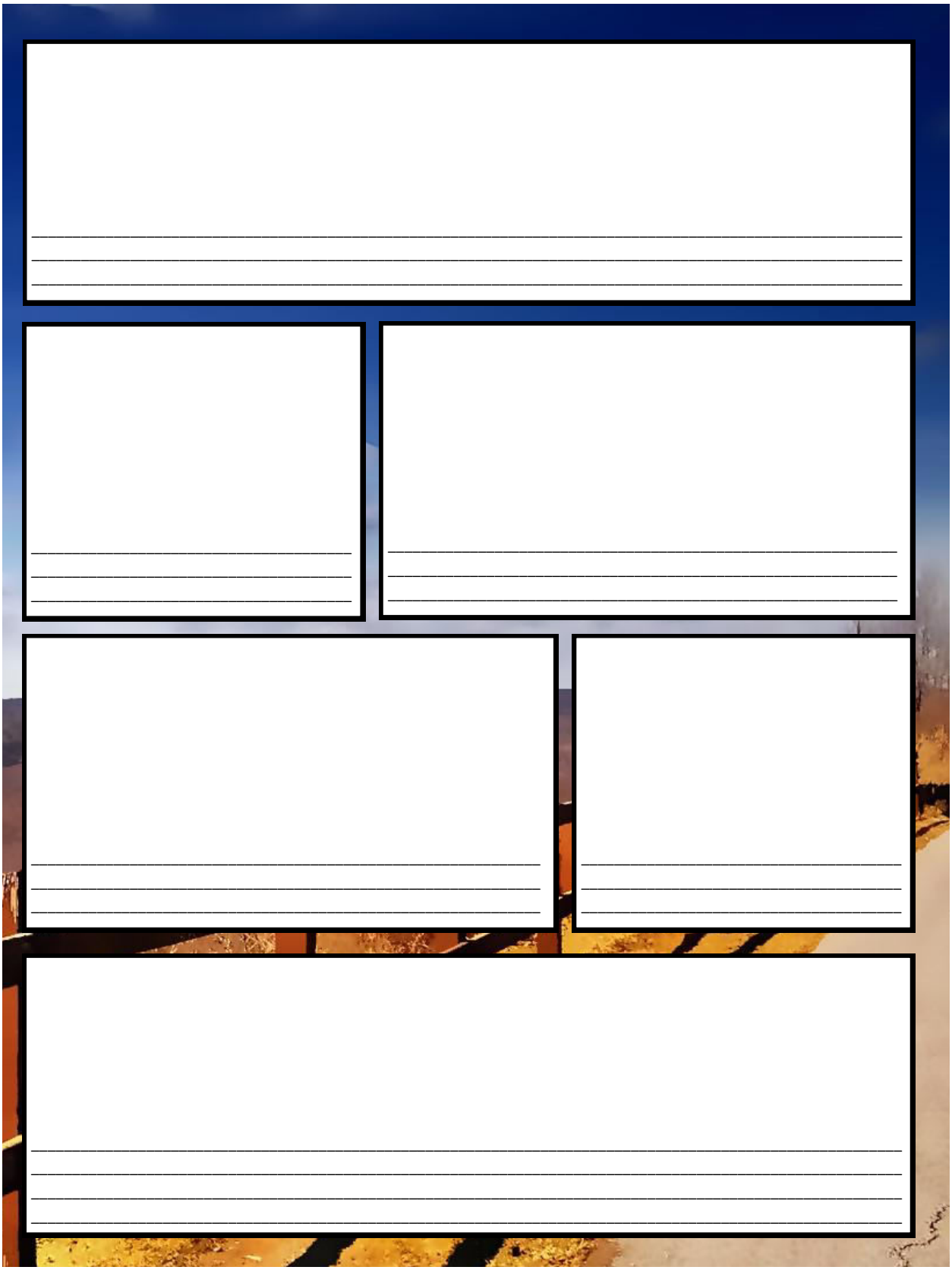


Page Assessing Desire for Group Power

Pages Assessing Intergroup Event







Individual Questionnaire Completed by Participants Following the Graphic Novel

Collective Autonomy

Please base your responses to these questions imagining that you really were a Hoye living on Grabodia and that the events described in the novel really took place. Please answer these questions with respect to the HOYE people BEFORE the Major Intergroup Event. Please rate your agreement with the following statements on a scale from 1 to 7 (1=you agree the most and 7=you agree the least).

1. We (the Hoyes) were free to determine our identity before the major intergroup event.
2. Before the big intergroup event the Arados imposed things onto our group's identity.
3. Before the major intergroup event, the Arados told our group what we could and could not do.
4. Before the major intergroup event, we felt controlled by the other group.
5. We (the Hoyes) have been free to determine what we do as a people before the major intergroup event.
6. Before the major intergroup event, the Arados supported the right that we (the Hoyes) have to act in accordance with our identity.

Need for Power

Please base your responses to these questions imagining that you really were a Hoye living on Grabodia and that the events described in the novel really took place.

1. Prior to the major intergroup event, our group (the Hoyes) would have liked to have had more influence as a group.

Prior to the major intergroup event, our group (the Hoyes) would have liked to have had more say during their interactions with the Arados.

2. Prior to the major intergroup event, our group (the Hoyes) would have liked to have had a greater level of control when interacting with the Arado.
3. Prior to the major intergroup event, our group (the Hoyes), our group would have liked to have had more power as a group.

Other Variables Measured Not Included in Analyses for Supplemental Study 1

1. Group Identification
2. Feeling of group power
3. Positive/negative traits associated with Ingroup and Outgroup
4. Warmth/competence traits associated with Ingroup and Outgroup
5. Personal need satisfaction experienced while completing the graphic novel.
6. Enjoyment of completing the graphic novel task
7. Perceived autonomy support from other ingroup members
8. Positive/negative affect experienced while completing the graphic novel task
9. Baseline enjoyment of video games / graphic novels/ comics

APPENDIX E: McGill Ethics Approval – Study 1 & 3, Manuscript 1 & Study 1, Manuscript 2

McGill

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Research Ethics Board II
Certificate of Ethical Acceptability of Research Involving Humans

REB File #: 479-0514

Project Title: The collective autonomy of one's cultural group and wellbeing

Principal Investigator: Frank Kachanoff

Department: Psychology

Status: Ph.D. Student

Supervisor: Prof. D. Taylor

Co-Investigators/Other Researchers: Thomas Khullar

Funding Agency/Title: FQRSC (164404), SSHRC (890-2011-0141)

Approval Period: June 03, 2014 – June 04, 2015

The REB-II reviewed and approved this project by delegated review in accordance with the requirements of the McGill University Policy on the Ethical Conduct of Research Involving Human Participants and the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.

Deanna Collin
Research Ethics Administrator

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* All research involving human participants requires review on an annual basis. A Request for Renewal form should be submitted 2-3 weeks before the above expiry date.
* When a project has been completed or terminated a Study Closure form must be submitted.
* Should any modification or other unanticipated development occur before the next required review, the REB must be informed and any modification can't be initiated until approval is received.

APPENDIX F: McGill Ethics Approval – Study 2, Manuscript 1 & Study 3, Manuscript 2

McGill

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Research Ethics Board II
Certificate of Ethical Acceptability of Research Involving Humans

REB File #: 35-0613

Project Title: The Coat of Arms Paradigm: Exploring the effects of collective autonomy and collective distinctiveness on group cohesion and motivation

Principal Investigator: Frank Kachanoff **Department:** Psychology

Status: Ph.D. Student **Supervisor:** Prof. D. Taylor

Funding Agency/Title: FQRSC 164404; SSHRC 890-2011-0141

Approval Period: June 27, 2013 to June 26, 2014

The REB-II reviewed and approved this project by delegated review in accordance with the requirements of the McGill University Policy on the Ethical Conduct of Research Involving Human Participants and the Tri-Council Policy Statement: Ethical Conduct For Research Involving Humans.

Deanna Collin
Ethics Review Administrator, REB I & II

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* All research involving human participants requires review on an annual basis. A Request for Renewal form should be submitted 2-3 weeks before the above expiry date.
* When a project has been completed or terminated a Study Closure form must be submitted.
* Should any modification or other unanticipated development occur before the next required review, the REB must be informed and any modification can't be initiated until approval is received.

APPENDIX G: McGill Ethics Approval – Study 2, Manuscript 2

McGill

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Research Ethics Board II
Certificate of Ethical Acceptability of Research Involving Humans

REB File #: 154-0915

Project Title: The collective autonomy of one's cultural group in specific intergroup contexts

Principal Investigator: Frank Kachanoff **Department:** Psychology

Status: Master's Student **Supervisor:** Prof. Donald M. Taylor

Co-investigator(s): Fiona Cooligan (Student, Carleton University); Julie Caouette (Adjunct Professor, Carleton University); Michael Wohl (Professor, Carleton University)

Funding: FQRSC, SSHRC

Approval Period: November 5, 2015 to November 4, 2016

The REB-II reviewed and approved this project by full review in accordance with the requirements of the McGill University Policy on the Ethical Conduct of Research Involving Human Participants and the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.

Deanna Collin
Ethics Review Administrator, REB I & II

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* All research involving human participants requires review on at least an annual basis. A Request for Renewal form should be submitted 2-3 weeks before the above expiry date. Research cannot be conducted without a current ethics approval.
* When a project has been completed or terminated, a Study Closure form must be submitted.
* Unanticipated issues that may increase the risk level to participants or that may have other ethical implications must be promptly reported to the REB. Serious adverse events experienced by a participant in conjunction with the research must be reported to the REB without delay.
* Modifications must be reviewed and approved by the REB before they can be implemented.
* The REB must be promptly notified of any new information that may affect the welfare or consent of participants.
* The REB must be notified of any suspension or cancellation imposed by a funding agency or regulatory body that is related to this project.
* The REB must be notified of any findings that may have ethical implications or may affect the decision of the REB.

APPENDIX H: McGill Ethics Approval – Study 4, Manuscript 2

McGill

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Research Ethics Board II
Certificate of Ethical Acceptability of Research Involving Humans

REB File #: 131-0816

Project Title: Inversion: Exploring How Formerly Low-Power Groups Structure Society when they become high power

Principal Investigator: Frank Kachanoff

Status: Ph.D. Student

Department: Psychology

Supervisor: Prof. Donald Taylor

Co-Investigators/Other Researchers: Alana Cohen, Jonathan Doherty, Annabelle Cournoyer

Funding: FQRSC

Approval Period: September 6, 2016 to September 5, 2017

The REB-II reviewed and approved this project by delegated review in accordance with the requirements of the McGill University Policy on the Ethical Conduct of Research Involving Human Participants and the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.

Deanna Collin
Ethics Review Administrator, REB I & II

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* All research involving human participants requires review on at least an annual basis. A Request for Renewal form should be submitted 2-3 weeks before the above expiry date. Research cannot be conducted without a current ethics approval.
* When a project has been completed or terminated, a Study Closure form must be submitted.
* Unanticipated issues that may increase the risk level to participants or that may have other ethical implications must be promptly reported to the REB. Serious adverse events experienced by a participant in conjunction with the research must be reported to the REB without delay.
* Modifications must be reviewed and approved by the REB before they can be implemented.
* The REB must be promptly notified of any new information that may affect the welfare or consent of participants.
* The REB must be notified of any suspension or cancellation imposed by a funding agency or regulatory body that is related to this project.
* The REB must be notified of any findings that may have ethical implications or may affect the decision of the REB.

APPENDIX I: McGill Ethics Approval – Supplemental Study 1, Manuscript 2

McGill

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Research Ethics Board II
Certificate of Ethical Acceptability of Research Involving Humans

REB File #: 115-1014

Project Title: The graphic novel paradigm: Exploring the relation between collective autonomy, motivation and intergroup relations

Principal Investigator: Frank Jake Kachanoff

Department: Psychology

Status: Ph.D. Student

Supervisor: Prof. Donald M. Taylor

Co-Investigators/Other Researchers: Danaelle Cottier

Funding Agency/Title: FQRSC; SSHRC

Approval Period: October 10, 2014 – October 9, 2015

The REB-II reviewed and approved this project by delegated review in accordance with the requirements of the McGill University Policy on the Ethical Conduct of Research Involving Human Participants and the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.

Deanna Collin
Research Ethics Administrator

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* All research involving human participants requires review on an annual basis. A Request for Renewal form should be submitted 2-3 weeks before the above expiry date.
* When a project has been completed or terminated a Study Closure form must be submitted.
* Should any modification or other unanticipated development occur before the next required review, the REB must be informed and any modification can't be initiated until approval is received.