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Social axiom and group identity explain participation in a societal event in Hong Kong

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The present research aims to identify cognitive and affective factors that explain participation in societal events from a social psychological perspective. This study examined the role of generalized beliefs about the world in the prediction of collective action, and adopted a diary method by collecting daily measures for two consecutive weeks during the 2014 Hong Kong protests. Social identity was significantly associated with group-related emotions and social axiom was significantly associated with group efficacy, in turn affecting social movement participation. Multilevel analyses showed that group-related emotions and group efficacy explained the effect of time on participation in the movement. Students exhibited variability in the extent of their participation: protesters who "went out to the streets" were more driven by group-related emotions than were the non-protesters who "stayed in." The findings attested to the added value of worldviews in explaining the psychological mechanisms of collective action.

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Introduction

In recent years, social unrest has been increasing around the world. According to the 2020 Global Peace Index by the Institute for Economics and Peace, civil unrest has roughly doubled from 2011 to 2018, with the rise of protests, riots, and strikes. The factors that induce people to participate in social movement activities have prompted sociologists to investigate the perceived costs and benefits of participation, and attracted psychologists to examine the role of group identification in collective action (e.g., Klandermans, 1984, 1997; Olson, 1977; Simon et al., 1998; Stürmer and Simon, 2004) and civic engagement in well-being (Chan and Mak, 2020). Social psychological research has investigated the effects of grievances, efficacy, identification, emotions and social embeddedness on protest participation (see van Stekelenburg and Klandermans, 2013 for a review). Generalized beliefs about the world, however, have rarely been explored in the literature on collective action. The present research aims to incorporate worldviews as a belief system into the prediction of social movement participation.

The 2014 Occupy Central Movement

The 2014 Hong Kong protests, also coined the "Occupy Central Movement" or "Umbrella Movement", garnered enormous media attention worldwide. A series of sit-in street protests occurred from September 28 to December 15, 2014. The principle of "one country, two systems" has been adopted since China resumed sovereignty over the British colony of Hong Kong on July 1, 1997. Some were concerned that their Hong Kong identity would become a subgroup identity and be obscured by a superordinate identity of Chinese national identity (Brewer, 1999; Chan, 2016). Cheng and Chan (2017) summarized a timeline of key events to analyze the antecedents, contingencies and spaces in the Occupy Movement. Early in January 2013, law professor Benny Tai proposed a civil disobedience campaign for electoral reform. The Central People's Government issued a White Paper on the Practice of the "One Country Two Systems" Formula on June 10, 2014. Then on August 31, the Standing Committee of the National People's Congress announced its decision on the 2017 Chief Executive election.

Subsequently, the Hong Kong Federation of Students (HKFS) and Scholarism organized class boycotts from September 22 and sit-in protests outside the Central Government Offices (CGO). On September 27, the police arrested 13 protesters; many people soon gathered outside Civic Square, the courtyard of the CGO. On September 28, the police fired teargas. Benny Tai announced the commencement of Occupy Central at a rally and protesters occupied main roads and set up tents in key commercial districts of Hong Kong (Admiralty, Causeway Bay, and Monkok). Senior government officials held an open dialog with the HKFS on October 21. The police cleared the protest sites in Mongkok, Admiralty, and Causeway Bay from November 25 to December 15.

The scope, intensity, and duration of participation in this societal event are unprecedented in this metropolitan city characterized by its pragmatism and efficiency. Scholars have studied this event from different perspectives, and have focused on, for example depressive symptoms and post-traumatic stress during and after social unrest (Ni et al., 2016, 2017, 2020), political movements and concerns as risk factors of population mental health (Lau et al., 2017), the influence of celebrities on social media (Chan and Ng, 2017), and the impact of manipulated news (Wong et al., 2021). In this research, we used a diary design to track the course of participation in the Occupy Central movement in Hong Kong and identify the underlying psychological mechanisms that account for the temporary changes of collective action.

Social identity and group-related emotions

Social identity theories (e.g., Tajfel, 1978) describe a "hot" system involving emotion and motivation to illuminate the role of social categorization in affecting behaviors and group phenomena, whereas social cognitive theories use a "cold" system involving thinking and knowing to explicate the process of social information processing in guiding cognitions and responses (Lam et al., 2006). The two systems complement each other to explain and predict group phenomena. Drawing on this "hot" versus "cold" system, we propose a model that incorporates both social categorization and social beliefs to predict collective action (see Fig. 1). From the perspective of social categorization, identification with a social category, especially identifying with a disadvantaged group and with a social movement or movement organization, predicts willingness to participate in collective action concurrently (Simon et al., 1998) and prospectively (Stürmer and Simon, 2004). As one's self-concept derives from group membership as well as the value and emotional significance attached to that membership (Tajfel, 1978), membership of the group drives emotions in a political event and in turn motivates involvement in the event.

Being affiliated to various groups and taking on different roles, people possess multiple identities, which are dynamic and variable. An identity becomes the focus of attention while invoked by the situation. The groups to which people belong influence selfhood and identity. Ellemers et al. (2002) argued that group commitment and features of the social context are essential conditions of social identity. When members who are highly committed to their group face threat directed to the group, they are likely to have perceptual, affective, and behavioral responses to strive for group affirmation. They may emphasize the distinctiveness of the group, express affective reactions, and engage
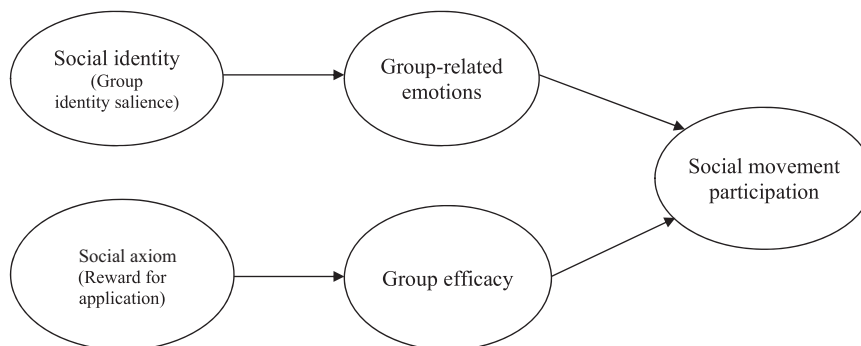

Fig. 1 The proposed model with affective and cognitive pathways predicting social movement participation.

in collective action to reassert group value. Based on three meta-analyses, the integrative social identity model of collective action (SIMCA) proposed by van Zomeren et al. (2008) explained collective action through three predictors, including perceived injustice, perceived efficacy, and social identity. Among these factors, group identification is an important force that mobilizes people for social change and collective action.

In a social movement, collective goals and shared concerns among a group of individuals make their group identity salient. The salience of social identity strengthens the positive regard for the group and shapes an individual's emotions as a member of the group. The positive group-related emotions hence mobilize individuals to take part in political activities that may benefit the group and assert the rights of the group. Group-related emotions have been found to influence the behavior of group members, such as willingness to engage in social action (Livingstone et al., 2011). The intergroup emotion theory (Smith, 1993) posits that the salience of a social identity provides a basis for group members to experience group-based emotions, which contribute to intragroup and intergroup attitudes and behavior (Mackie et al., 2000; Seger et al., 2008; Smith et al., 2007) and predict collective action (Giner-Sorolla et al. 2007). Closely linked to group identification, group emotions are experienced by people in response to group-related events and different from individual-level emotions that are personal in nature. In the case of the Occupy Movement, it is hypothesized that the salience of a Hong Kong identity would be associated with positive emotions as a Hong Konger and in turn predict social movement participation. Under the given social circumstance, it is hypothesized that group identity that is more specific to activist identities, but not other social identities such as friend identity and family identity, will be predicative of social movement participation.

Social axioms and group efficacy

From the perspective of social beliefs, one's generalized expectancies about the world, especially the belief that effort leads to desirable outcomes, cultivate supportive attitudes toward the political movement and in turn guide individual endeavors. Deriving from personal experiences or the socialization process, individuals hold different views about people, social groups, social institutions, the physical environment, and the spiritual world, termed "social axioms" by Leung and colleagues (2002). These worldviews serve as expectancies to shape perceived values and outcomes of a particular action (Chen et al., 2016). Worldviews are one's perceptions about the world in which one functions rather than about oneself or one's group that negotiates that world. As such, worldviews are measures of the social situation as perceived by the actor, a situational construal rather than a self-construal.

Multicultural studies have been conducted in forty nations to identify the factor structure of social axioms (Leung and Bond, 2004). At the culture level, ecological factor analysis has confirmed two dimensions, namely Societal Cynicism and Dynamic Externality (Bond et al., 2004b). They were found to correlate with country-level socio-economic-political and psychological indicators. At the individual level, a five-factor structure has been validated pan-culturally, namely social cynicism, fate control, social complexity, reward for application, and religiosity (initially labeled spirituality).

Worldwide studies have explored their functional utility (e.g., Bond et al., 2004a; Chen et al., 2016; Leung and Bond, 2004). Social axioms serve as general knowledge about the world and predict attitudinal and behavioral variables in different domains, such as modest behavior (Chen et al., 2017), political attitudes (Keung and Bond, 2002), paranormal beliefs (Singelis et al.,

2003), vocational interests (Bond et al., 2004a), attitudes toward help-seeking (Kuo et al., 2006), and gambling behavior (Wu et al., 2019). Social axioms significantly predict self-worth and well-being indicators, such as life satisfaction (Chen et al., 2005; Lai et al., 2007), psychological distress (Kuo et al., 2006), negative affect (Tang and Wu, 2010), suicidal ideation (Lam et al., 2010), and death anxiety (Hui et al., 2007). However, no existing research has examined the effects of social axioms on participation in social movements.

The axiom factor of Reward for Application denotes the belief that human agency and endeavors will lead to favorable results. Different from beliefs about the self and judgments of personal capability, this axiom factor reflects a general orientation to goals and fulfillment of expectations (Hui and Hui, 2009). Reward for Application has been found to predict active coping (Bond et al., 2004a) and better adjustment in intercultural contexts (Safdar et al., 2006). It also predicts life satisfaction through the mediation of self-views among adolescents and young adults (Chen et al., 2016).

Perceiving the effort-reward link is especially conducive to the belief in the effectiveness of collective action and the growth of a positive attitude toward a social movement, which transform subjective expectations of rights and benefits for the group into social action in a political event. This shared belief forms the perception of group efficacy, which denotes that group members view their disadvantage as changeable and support collective effort to solve group-related problems (van Zomeren et al., 2004). The SIMCA has shown that perceived efficacy is a robust predictor of collective action (van Zomeren et al., 2008), and the subjective expectancy of collective power or strength is a more proximal predictor of unified effort to transform the situation and social structure (Klandermans, 1984; Mummendey et al., 1999). It is hypothesized that in the Occupy Movement, belief in reward for application would be associated with group efficacy and in turn predict social movement participation.

The present study

Taken together, both social identity and social axioms are useful for understanding collective action. We adopted a diary study design with daily measures across two consecutive weeks during the Hong Kong protests to test the hypothesized model. A cross-sectional design, which captures participants' emotions, cognitions, and behaviors at a particular time point or in a retrospective manner, cannot trace daily changes during the course of an ongoing event. Initial participation in a political event may be a momentary decision driven by various factors, and yet sustainable behavior reflects the juxtaposition of these factors in a continuous process. It is further hypothesized that group-related emotions and group efficacy will explain the temporal changes of social movement participation, as behavioral variation is regulated jointly by affective states and cognitive processes that are proximal to the course of action. As such, the effect of time on social movement participation will be explained by participants' daily patterns of emotions as a Hong Konger and group efficacy. Thus, time is the independent variable in the analysis of daily changes across two weeks.

To account for the fluctuations of participation in the movement over time, we differentiate the effects of positive and negative emotions. Negative emotions that arise from perceived injustice may motivate people to take part in a social movement (Thomas et al., 2009). Indeed, group-based anger has been found to induce collective action (Iyer et al., 2007; Leach et al., 2007; van Zomeren et al., 2004; Yzerbyt et al., 2003). When group value is threatened, members may express anger toward an outgroup (Ellemers et al., 2002). In the present study, we attempt to

examine different emotions other than the well-established effect of group-based anger, especially positive emotions as ingroup members. Previous research has found that temporal changes of group identity salience could be explained by affective adaptation, which refers to the weakening process of individuals' affective reactions after continuous exposure to emotional events (e.g., Frederick and Loewenstein, 1999; Fredrick and Loewenstein, 1999; Wilson and Gilbert, 2008). When the salience of relevant social identity is elevated as a response to an emotion-arousing group event, it declines over time and returns to neutrality, as mediated by the decline of positive emotions during the event (Chen et al., 2019). Thus, the temporal changes of positive emotions as a Hong Konger may explain the trajectory of collective action during the Hong Kong protests. Our previous study tracking participants' changes of identity salience and positive emotions for 17 days during the 2008 Beijing Olympics found similar patterns of changes across 11 times of continuous assessment within an experimental session (Chen et al., 2019). Thus, the present study administered the measures for 14 consecutive days and examined patterns of positive and negative emotions.

The extent of participation in the movement varied among students, some of whom went out and protested on the streets while others did not. We will compare the predictive power of group-related emotions and group efficacy on individuals' participation in the movement over time between the two groups. Given that committed activists, compared with nominal supporters, are usually accompanied by strong emotions in strong situations, it is hypothesized that protesters would be more driven by the affective forces than non-protesters.

In addition to the key variables, we include control variables to rule out alternative explanations. Specifically, individuals' political orientation may be a confounding factor to elicit response bias. During the daily fluctuations of the protests, individuals' vigor and energy may produce fatigue effect. Therefore, political orientation, which reflects one's views and position in political events, and subjective vitality, which captures one's vigor and energy, are included as covariates to rule out response bias and fatigue effect.

Based on the above conceptualizations, we will test the following hypotheses.

H1. Belief in reward for application would be associated with group efficacy and in turn associated with social movement participation.

H2. The salience of a Hong Kong identity would be associated with group-related emotions as a Hong Konger and in turn associated with social movement participation.

H3. Group identity that is more specific to activist identities, but not other social identities such as friend identity and family identity, would be associated with social movement participation.

H4. Group-related emotions and group efficacy would explain the temporal changes of social movement participation.

Method

Participants and procedure. To capture the daily changes during the course of an ongoing social movement, the current research adopted a multilevel design with daily reports (Level 1) nested within persons (Level 2). Simulation studies for multilevel modeling indicated that in general more than 100 highest-level units would be needed for the unbiased estimates of highest-level variance components (Busing, 1993; van der Leeden and Busing, 1994). To ensure the accurate estimates of variance components across levels of analysis in each group (i.e., protesters or non-protesters), we intended to sample at least 200 participants with an assumption of equal sample size across protesters and non-protesters.

We recruited 234 students from a university in Hong Kong, who responded to a recruitment email. Starting from October 1, 2014, participants completed online measures each day for two consecutive weeks. The civil disobedience campaign began on September 28, earlier than its planned launch date of October 1, 2014. In the present study, participants completed online measures each day from October 1 to 14, 2014 during the Occupy Movement. They were allowed to log on to the online survey only between 8:00 p.m. and 3:30 a.m. the next day, so as to ensure that their responses reflected their psychological experiences on that day. If they missed the survey during this period, their responses on the specific day were recorded as missing values. Nine participants were excluded because eight of them did not start on the first day and thus missed demographic information and one did not complete the measures on student movement participation, an important outcome variable. The final sample consisted of 225 university students (152 females; $M_{age} = 19.88$, $SD = 2.01$). On average, they completed the measures for 11.07 days out of the maximum of 14 days.

Measures. Participants filled out the following instruments in Chinese each day. They also reported demographic information, such as age and gender, at the end of the survey for the first day. As participants responded the measures each day for 14 consecutive days, we minimized the questionnaire length by adopting single-item measures for some individual difference variables to reduce fatigue effect and attrition rate.

Social movement participation. Participants were asked to report whether they participated in the student movement[1] on that day in the following ways: (a) deliberately wear clothes suggested by the organizers (e.g., black clothes); (b) deliberately wear accessories suggested by the organizers (e.g., yellow ribbon); (c) participate in the class boycott; (d) attend rallies on campus; (e) attend rallies off campus; (f) provide financial or material support; (g) discuss with others, publicize, or disseminate news about the student movement (e.g., via Facebook, WhatsApp, or WeChat); and (h) take part in planning, preparing, or working as staff for the student movement. Their answers to these yes–no questions were aggregated each day, with high scores indicating more participation in the movement.

Reward for application. The social axiom factor of reward for application was measured by a single item, "Endurance and determination are key to achieving goals." Participants rated this belief statement on a 5-point Likert scale ranging from 1 (*strongly disbelieve*) to 5 (*strongly believe*). This item was selected from the subscale of reward for application in the Social Axioms Survey II (Leung et al., 2002), as it has the highest factor loading based on data from 11 cultural groups including Hong Kong. The Social Axioms Survey (SAS; Leung et al., 2002) assesses people's beliefs about how the world functions and has been well validated among 40 cultural groups (Leung and Bond, 2004). The SAS consists of five factors, and reward for application was selected for this study because of its conceptual relevance.

Group efficacy. Participants' perceived efficacy of the student movement was measured by three items (e.g., "How likely is it that the current student movement can achieve its goals?"). Their responses were anchored on 10-point Likert scales ranging from 1 (*highly unlikely*) to 10 (*highly likely*). High scores indicated higher perceived efficacy of the movement ($\alpha = 0.65$).

Table 1 Summary of within-individual (lower triangular) and between-individual (upper triangular) correlations among key measures.

	M	*SD*	**1**	**2**	**3**	**4**	**5**	**6**
1. Identity salience	5.42	1.42	–	0.67***	0.19*	0.17*	0.36***	0.25**
2. Group-related positive emotions	3.13	1.17	0.23***	–	0.37***	−0.02	0.43***	0.41***
3. Group-related negative emotions	3.63	1.34	0.17**	0.10*	–	−0.04	0.17*	0.23*
4. Reward for application	4.10	0.71	0.10*	0.10**	−0.03	–	0.25**	0.09
5. Group efficacy	6.08	1.71	0.24***	0.28***	0.19***	0.13*	–	0.45***
6. Social movement participation	1.53	1.85	0.23***	0.25***	0.18***	0.07*	0.29***	–

*p < 0.05; **p < 0.01; ***p < 0.001.

Identity salience. As adapted from Yip's study (Yip, 2005), participants were asked to think about the following identities and indicate on that day how prominent or salient each identity was to them: Hong Konger, friend, family (as a child of their parents), and Chinese. Their responses to identity salience were anchored on 7-point scales ranging from 1 (*not at all salient*) to 7 (*extremely salient*).

Group-related emotions. We extracted 15 emotion items from Watson et al. (1988) and Larsen and Diener (1992), including eight positive emotions (*excited, relaxed, interested, happy, proud, strong, inspired,* and *enthusiastic*) and seven negative emotions (*ashamed, frustrated, anxious, worried, confused, sad,* and *irritable*). Participants were asked to reflect on the student movement and related matters on that day and rate the degree to which they felt these emotions as a Hong Konger on 7-point scales, ranging from 1 (*not at all*) to 7 (*extremely*). The mean score was computed for each day as an index of daily positive or negative group-related emotions ($\alpha = 0.91$ and 0.92, respectively).

Personal emotions. To differentiate group-related emotions from personal emotions, we used the same 15 items for group-related emotions to measure personal emotions, but asked participants to rate how strongly they felt the emotions that day on 7-point scales, ranging from 1 (*not at all*) to 7 (*extremely*). The mean score was computed for each day as an index of daily positive or negative personal emotions ($\alpha = 0.92$ and 0.93, respectively).

Political orientation. Participants' political orientation was assessed by a single-item measure that has been used in previous studies on political thoughts and behaviors (e.g., Jost, 2006; Jost et al., 2009). They were asked to choose an answer that most represented their views on a 7-point scale ranging from 1 (*very liberal*) to 7 (*very conservative*).

Subjective vitality. The scale developed by Ryan and Frederick (1997) was adapted to measure a positive sense of possessing energy and aliveness, which reflect one's physical condition and psychological state. Participants were asked to rate how the five statements applied to them on 7-point scales ranging from 1 (*not at all true*) to 7 (*very true*). A sample item is, "I feel energized today" ($\alpha = 0.97$).

Results
The collected data had a multilevel structure with 2489 diary reports nested within 225 participants. To account for the nested structure, a series of multilevel mediation models were tested using multilevel structural equation modeling with random intercepts across individuals and fixed slopes, while controlling for age, gender, and political orientation in all of the following analyses. Under the framework of multilevel structural equation modeling, variables were decomposed into two orthogonal latent

parts: within-component with group-mean centering and between-level component (Asparouhov and Muthén, 2011; Muthén, 1994). The multilevel analyses reported in the text were focused on the lower-level model, fully utilizing all 2489 diary reports, and indirect effects were estimated following the procedures outlined by Preacher et al. (2010). The inferential tests for the indirect effects were performed using asymptotic delta method as there is no agreed-upon best way to employ bootstrapping in multilevel modeling (Van der Leeden et al., 2008; Wang et al., 2006). Intraclass correlations of the measures ranged from 0.59 to 0.77; on average, about 65% of the total variance in the daily measures could be explained by the interindividual differences. Descriptive statistics, within-individual correlations, and between-individual correlations are summarized in Table 1.

Testing the hypothesized model. Overall, the proposed model fitted the data well, $\chi^2 (3) = 55.94$, $p < 0.001$, comparative fit index (CFI) = 0.92, standardized root-mean square residual (SRMR) = 0.04, root-mean-square errors of approximation (RMSEA) = 0.08. Group efficacy mediated the effect of reward for application on social movement participation, indirect effect = 0.022, $p = 0.006$, 95% CIs [0.006, 0.037]. Consistent with H1, reward for application predicted perceived efficacy of the social movement, $\beta = 0.11$, $p = 0.01$, 95% CIs [0.03, 0.19], which in turn positively predicted social movement participation, $\beta = 0.20$, $p < 0.001$, 95% CIs [0.13, 0.28]. The direct effect of reward for application on social movement participation was not significant, $\beta = 0.02$, $p = 0.491$, 95% CIs [−0.04, 0.08]. Given a significant indirect effect from reward for application as an independent variable (IV) on social movement participation as a dependent variable (DV) through perceived efficacy of the social movement (mediator) together with a non-significant direct effect from the IV on the DV, we can conclude that group efficacy fully mediated the effect of reward for application on social movement participation.

The effect of Hong Kong identity on social movement participation was mediated by positive group-related emotions, indirect effect = 0.027, $p < 0.001$, 95% CIs [0.013, 0.040], and negative group-related emotions, indirect effect = 0.014, $p = 0.023$, 95% CIs [0.002, 0.025]. Consistent with H2, the salience of group identity significantly predicted positive emotions felt as a Hong Konger, $\beta = 0.15$, $p < 0.001$, 95% CIs [0.09, 0.21], and negative emotions felt as a Hong Konger, $\beta = 0.11$, $p < 0.001$, 95% CIs [0.06, 0.15], both of which in turn predicted social movement participation positively, $\beta = 0.18$, $p < 0.001$, 95% CIs [0.11, 0.25], and $\beta = 0.13$, $p = 0.013$, 95% CIs [0.03, 0.23], respectively. The direct effect of Hong Kong identity on social movement participation was still significant, $\beta = 0.13$, $p < 0.001$, 95% CIs [−0.08, 0.19], indicating the partial mediation effects of group-related emotions. In terms of the covariates, age was negatively associated with group-related positive emotions, $\beta = -0.12$, $p = 0.012$, 95% CIs [−0.02, −0.23], gender (male = 1;
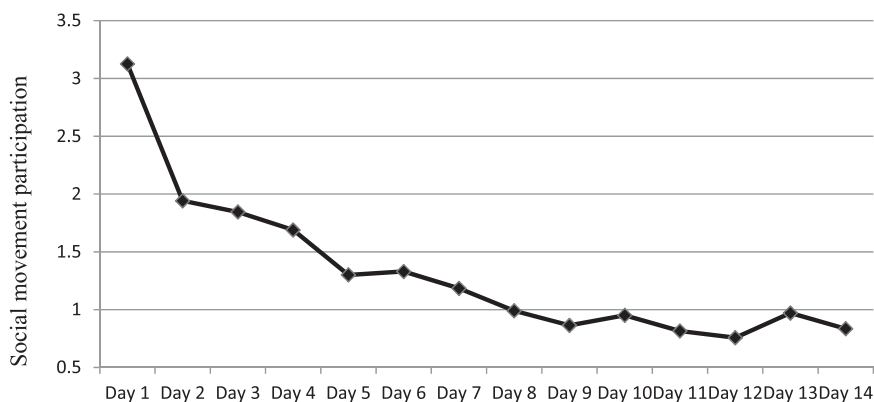
Fig. 2 Declining trajectory of social movement participation throughout the 14 days.
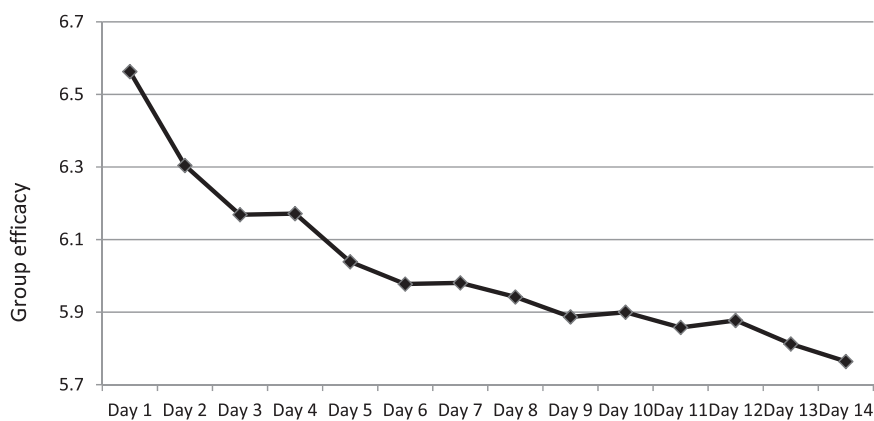

Fig. 3 Declining trajectory of group efficacy throughout the 14 days.

female $= 0$) was positively associated with perceived efficacy of the social movement, $\beta = 0.19$, $p = 0.001$, 95% CIs [0.08, 0.29], and social movement participation, $\beta = 0.13$, $p = 0.033$, 95% CIs [0.01, 0.25], while political orientation was positively associated with group-related positive emotions, $\beta = 0.21$, $p < 0.001$, 95% CIs [0.13, 0.41], perceived efficacy of the social movement, $\beta = 0.47$, $p < 0.001$, 95% CIs [0.35, 0.59], reward for application, $\beta = 0.29$, $p < 0.001$, 95% CIs [0.14, 0.43], and identity salience of Hong Konger, $\beta = 0.28$, $p = 0.001$, 95% CIs [0.12, 0.43], was not associated with group-related negative emotions, $\beta = -0.04$, $p = 0.643$, 95% CIs [−0.18, 0.11] at the between-individual level.

To examine the effects of identity salience on social movement participation, ancillary analysis was conducted on participants' different social identities, namely, Hong Konger, friend, family (as a child of their parents), and Chinese. Multilevel regression results showed that social movement participation was significantly predicted only by the salience of Hong Kong identity, $\beta = 0.23$, $p < 0.001$, 95% CIs [0.17, 0.29], but not by the salience of friend identity, $\beta = -0.03$, $p = 0.201$, 95% CIs [−0.08, 0.02], child identity, $\beta = 0.02$, $p = 0.529$, 95% CIs [−0.04, 0.07], and Chinese identity, $\beta = 0.00$, $p = 0.942$, 95% CIs [−0.07, 0.07]. Thus, only relevant Hong Konger identity, but not other social identities, exerted significant effect on social movement participation, supporting H3.

To differentiate group-related emotions from personal emotions, ancillary analysis was performed to examine their effects on social movement participation. Multilevel regression results revealed that social movement participation was significantly predicted by positive group-related emotions, $\beta = 0.22$, $p < 0.001$, 95% CIs [0.15, 0.29], and negative group-related emotions,

$\beta = 0.17$, $p < 0.001$, 95% CIs [0.10, 0.23], but not by positive personal emotions, $\beta = 0.02$, $p = 0.466$, 95% CIs [−0.04, 0.08], and negative personal emotions, $\beta = -0.00$, $p = 0.945$, 95% CIs [−0.07, 0.07]. These results indicate that emotions felt as a member of the group function differently from emotions felt as an individual.

Explaining the effects of time. To reveal the fluctuations of group efficacy, group-related emotions, and social movement participation during the time course, we conducted repeated-measures analysis of variance (ANOVA) among participants who completed the measures for all 14 days ($n = 103$). The effect of time on social movement participation was significant, $F(13, 1326) = 50.85$, $p < 0.001$, with a declining trend over time (see Fig. 2). Likewise, a temporal trend of decline was also observed in group efficacy, $F(13, 1326) = 8.50$, $p < 0.001$, positive group-related emotions, $F(13, 1326) = 22.09$, $p < 0.001$, and negative group-related emotions, $F(13, 1326) = 30.36$, $p < 0.001$ (see Figs. 3 and 4).

Next, we proceeded to examine whether group efficacy and group-related emotions could explain the declining trajectory of social movement participation. Based on the full sample of 225 students, the multilevel mediation model fitted the data well, $\chi^2(5) = 37.39$, $p < 0.001$, CFI $= 0.97$, SRMR $= 0.03$, RMSEA $= 0.05$. First, consistent with the results from repeated-measures ANOVA, number of days significantly predicted social movement participation, group efficacy, positive group-related emotions, and negative group-related emotions, $\beta = -0.27$ to -0.46, $ps < 0.001$, 95% CIs [−0.51 to −0.34, −0.40 to −0.21]. Second, group efficacy and
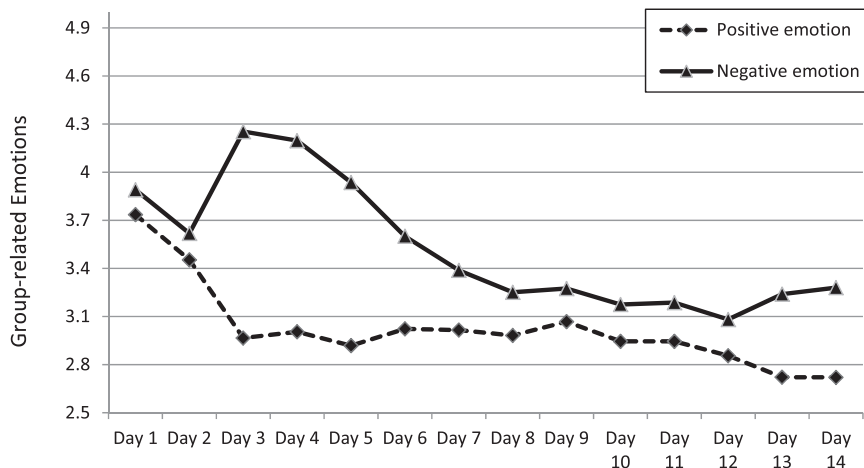
Fig. 4 Declining trajectories of positive and negative group-related emotions throughout the 14 days.
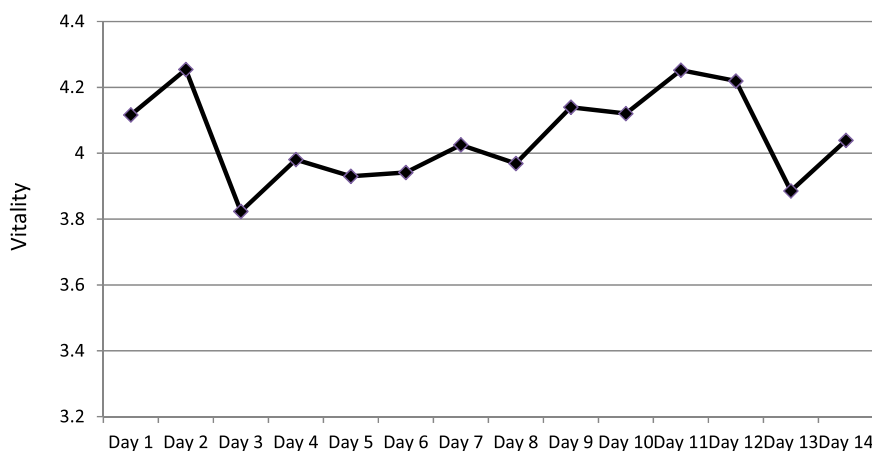

Fig. 5 The trajectory of subjective vitality throughout the 14 days.

positive group-related emotions positively predicted social movement participation, $\beta = 0.16$, $p < 0.001$, 95% CIs [0.09, 0.23], and $\beta = 0.08$, $p = 0.001$, 95% CIs [0.03, 0.13], respectively, but negative group-related emotions did not, $\beta = -0.04$, $p = 0.101$, 95% CIs [−0.08, 0.01]. Finally, as indicated by the lower-level mediation effect, the observed decline in social movement participation was primarily driven by group efficacy, indirect effect = −0.04, $p < 0.001$, 95% CIs [−0.07, −0.02], and positive group-related emotions, indirect effect = −0.03, $p = 0.003$, 95% CIs [−0.04, −0.01], supporting H4. However, the effect of time on social movement participation was not mediated through negative group-related emotions, indirect effect = 0.01, $p = 0.106$, 95% CIs [−0.003, 0.030].

Conceivably, the declining trend of social movement participation could be attributed to fatigue or boredom arising from completing the same measures day after day or the waning of physical strength after days of participating in the movement. To rule out alternative explanations, the trajectories of subjective vitality and political orientation were examined using repeated-measures ANOVA on participants who completed the measures for all 14 days ($n = 103$). A significant effect of time was found on subjective vitality, $F(13, 1326) = 2.62$, $p = 0.001$, and a marginally significant time effect on political orientation, $F(13, 1326) = 1.55$, $p = 0.09$. As shown in Figs. 5 and 6, the levels of subjective vitality and political orientation fluctuated throughout the 14 days, without a prominent linear increasing or decreasing trend. The observed patterns were supported by multilevel correlation analysis; there was neither linear correlation between time and

subjective vitality, $r = 0.03$, $p = 0.38$, 95% CIs [−0.03, 0.09], nor between time and political orientation, $r = 0.03$, $p = 0.39$, 95% CIs [−0.04, 0.09]. In other words, participants possessed the same subjective vitality and political orientation each day, but the curve of these variables did not exhibit a declining trend. More importantly, even after including political orientation as a covariate and subjective vitality as a predictor of social movement participation, the mediation effects of positive group-related emotions and group efficacy remained significant, indicating that affective and cognitive mechanisms accounted for the temporal changes of social movement participation over and above variation in one's energy level and political stand.

Comparing protesters and moderates. To further examine whether the power of the predictors differed in the extent of social movement participation, we divided the participants into protesters and non-protesters based on whether they went out to the streets and participated in the protests. We selected two behavioral items, namely, whether participants attended rallies off campus, and whether they took part in planning, preparing, or working as staff for the movement. Those who answered "yes" to either item on any of the 14 days were categorized as protesters ($n = 115$) who "went out to the streets" and the rest as non-protesters ($n = 110$) who "stayed in". While comparing the two groups, we recomputed the dependent variable by excluding these two items, since they were already used as selection criteria for grouping, and labeled it as collective action.
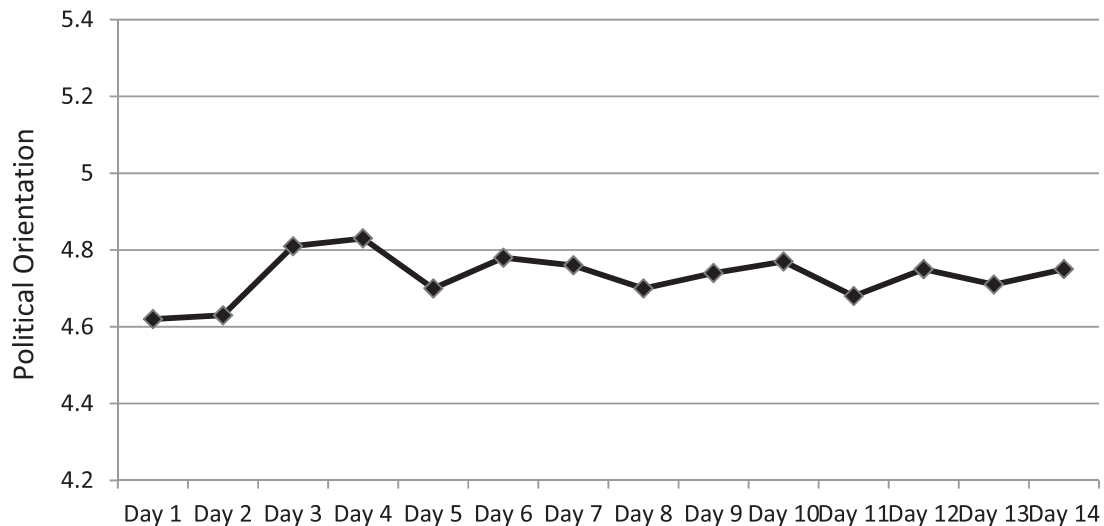
Fig. 6 The trajectory of political orientation throughout the 14 days.

Multiple-group analysis was performed to test the above multilevel mediation model. The configural model fitted the data well, χ^2 (6) = 45.18, $p < 0.001$, CFI = 0.97, SRMR = 0.03, RMSEA = 0.07. Similar to the above results, number of days significantly predicted group efficacy and positive group-related emotions; the strength of time effects was comparable and did not differ significantly between groups, $z < 1.96$, $p > 0.05$. Group efficacy significantly predicted collective action in both groups; the magnitude of its effect was equivalent between groups, $z = 0.23$, $p = 0.821$. Interestingly, positive group-related emotions displayed functional differences between groups, $z = 2.93$, $p = 0.003$. Among the protesters, positive group-related emotions significantly predicted collective action, $\beta = 0.12$, $p < 0.001$, 95% CIs [0.07, 0.17], and in turn mediated the time effect on collective action, indirect effect = −0.03, $p = 0.001$, 95% CIs [−0.05, −0.01]. Among the non-protesters, however, positive group-related emotions did not contribute to collective action, $\beta = 0.01$, $p = 0.878$, 95% CIs [−0.07, 0.09], and did not explain the time effect on collective action, indirect effect = −0.00, $p = 0.878$, 95% CIs [−0.03, 0.03]. Thus, the "cold" system contributed to participation in the movement among both protesters and non-protesters, but the protesters were more driven by the "hot" system than were the non-protesters.

Discussion

In the present research, we used a diary study design with daily measures for two consecutive weeks during the 2014 Hong Kong student movement, and tested a mediation model incorporating social categorization and worldviews in the prediction of collective action. The salience of Hong Kong identity exerted a significant effect with emotions as a Hong Konger being a mediator, whereas the axiom factor of reward for application exerted a significant effect with group efficacy as a mediator. The results of multilevel analyses explained the effect of time on social movement participation through the mediation of group-related emotions and group efficacy. Positive attitudes toward the movement were significantly associated with collective action among both protesters and non-protesters; protesters were more driven by group-related emotions than non-protesters.

In this study, we measured actual participation in social movement in a real-life context, rather than assessing the willingness or tendency to participate, and compared the factors affecting protesters versus non-protesters. Social psychology has long established that the tendency to engage in a behavior is a rational process of considering behavioral options and evaluating their consequences, which is affected by attitudes toward the behavior, subjective norms about it, and perceived behavioral control (Ajzen, 1991; Ajzen and Fishbein, 1980). The current results show that the decision to engage in actual participation in social movement is also influenced by an emotional process involving identification with the group and emotions as a group member. The strength of this emotional process predicts the actual behavior of people who take an active role in political events.

The diary design tracked the process of collective action and identified the affective and cognitive mechanisms underlying the temporal changes in social movement participation. Cross-sectional studies concurrently predict willingness to participate, and prospective designs may infer the directional influence on subsequent participation. Using the diary method to model the time course over two consecutive weeks enabled us to observe the decline of collective action and reveal the affective and cognitive factors, i.e., group-related emotions and group efficacy, which are proximal forces driving such decline, not due to the fluctuations of subjective vitality and political orientation. Political orientation was positively associated with group-related positive emotions but not with group-related negative emotions.

Previous studies examining the psychological processes of collective action have extensively examined the social identities of group members, such as collective identification and organizational identification (Simon et al., 1998; Stürmer and Simon, 2004). The present research added worldviews to the predictive framework and uncovered the role of the epistemic system and generalized expectancy. We operationalized worldviews as social axioms, which consist of five factors (Leung et al., 2002). Worldviews serve as a cognitive framework that helps people organize their value orientations and perceptions of person–environment relation to guide their actions (Chen et al., 2016). Different beliefs about how the world functions would induce different attitudes and behaviors. A general belief that endurance and determination are key to achieving goals was associated with perceived efficacy of social movement and in turn associated with participation in social movement. While reward for application seems most conducive to collective action, other axiom factors, such as a mistrust in human nature as captured by social cynicism, and an expectation of fated outcomes as depicted by fate control, may have negative effects and should be investigated in further studies.

Social axioms are individual difference variables that serve as a relatively distal force to influence social movement participation fully through group efficacy (full mediation), whereas the prominence of relevant social identity exerts both direct and indirect effects on social movement participation (partial mediation), as it moves into the perceptual foreground in the movement. Group efficacy reflects the belief that the group's action will accomplish the desired goals. This perceived efficacy (Bandura, 1997; Thomas et al., 2009) contributes to collective action and support for a movement (e.g., Cocking and Drury, 2004; Kelly and Breinlinger, 1995). As both reward for application and group efficacy measured in this study reflect efficacious cognitions, the effect of reward for application on social movement participation was fully explained by group efficacy. On the other hand, though social identity and group-related emotions share some emotional aspects of the collective, the salience of social identity may not just work through emotional route to affect social movement participation, and thus was partially mediated by group-related emotions. It is possible that other mediators may play a role in the psychological process. Thomas and colleagues (2009) suggested that group norms, such as descriptive norms for collective action and descriptive emotion norm, contribute to sustainable social and political action, in addition to the effects of meaningful social identity and descriptive normative efficacy beliefs.

Our results differentiated the contrasting effects of relevant versus other social identities, personal versus group-related emotions, and positive versus negative group-related emotions. Though people possess multiple social identities, especially Hong Kong students who identify with different cultural groups, not all identities become the focus of attention in an immediate social situation. In the context of a political movement, membership of the group involved in the collective action, instead of relational identities (e.g., friend, family) and identification with a superordinate category (e.g., Chinese), is most relevant to individuals' behavioral engagement in such events. A social movement aims to achieve goals for the group rather than concerning itself with personal costs and benefits, thereby entailing affective significance attached to the group in the process of political activities. Thus, other social identities (friend, family, and Chinese) and positive and negative personal emotions did not predict social movement participation significantly, supporting the distinctiveness of our model.

Taken together, the interesting patterns derived from real-life political events advance our understanding of the psychological mechanisms underlying multifaceted, versatile human behavior and experience. Our findings have implications for political and societal events. While researchers have emphasized the specificity of attitudes in the prediction of individual behavior (e.g., Ajzen and Fishbein, 1977), the present research further demonstrated that making emotional appeals which underscore group identity in addition to forging specific attitudes which reflect the worldview of an effort-reward link may induce mass participation in political and societal events.

The ups and downs of a social movement trigger positive and negative emotions among the members of the group. The current results indicate that both positive and negative emotions are related to participation in political activities, and positive emotions explain the effect of time on social movement participation. Previous research has revealed the importance of negative, injustice-related affect, such as group-based anger, in explaining collective action tendencies (van Zomeren et al., 2004). The present study identified the role of positive emotions in the process of sustaining collective action. Positive emotions provide desirable feedback to individuals in their goal pursuit, thereby reinforcing goal-oriented behavior and maintaining intrinsic motivation (Livingstone and Srivastava, 2014). Positive emotions shared within a group are rewarding to group members and likely

to sustain the course of social action. The decline of positive emotions over time in this study is similar to the pattern of positive emotions observed among Mainland Chinese participants during the 2008 Beijing Olympics, due to an affective adaptation process (Chen et al., 2019). Different from the current study, negative emotions were stable across the 17 days of the Olympics and not related to number of days, perhaps because Chinese athletes obtained the highest number of gold medals in that event, making positive emotions more salient.

Nevertheless, group efficacy was significantly associated with collective action among both protesters and non-protesters, but positive emotions accounted for the temporal changes of collective action in protesters but not in non-protesters. In other words, non-protesters' behavior was associated with the belief that the group was able to shape the social structure and transform the situation and destiny of the group. Blackwood and Louis (2011) have shown that committed activists' perceived group efficacy affected personal cost-benefit analyses in a longitudinal study. Evaluating the utility of involvement may be based on their judgements about the movement's overall success. Nevertheless, the present study was conducted in Hong Kong, which may be limited to specific historical contexts. The 2014 Occupy Movement has unique political and societal features that may not be generalizable to other movements. Due to time constraints, our study does not include many important factors, such as the role of past movement participation, formal organizational membership, ideology and possible injustice perceived by Hong Kong participants, which may be positively associated with participation in the Occupy Movement. Future research may incorporate other psychological predictors of collective action, such as perceived injustice, social support, and other sociostructural factors, such as perceived illegitimacy and instability of intergroup status differences, into the explanatory framework. Further studies may also analyze perceptions of personal benefits and costs at the individual level and group-based appraisals and coping at the group level to form a more inclusive and integrative account of social action.

Data availability

The data that support the findings of this research are available from the authors upon reasonable request.

Note

1 As the protest movement was initiated by students' class boycott in late September 2014 and the target sample of the present study was students, we used "student movement" in the questionnaire on October 1 and kept the same wording on subsequent days.

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Author contributions

All authors contributed to study conceptualization and data collection. The second author analyzed the data. The first and second authors wrote the manuscript.

Competing interests

The authors declare no competing interests.

Ethical approval

Approval was granted by the Human Subjects Ethics Sub-Committee at the authors' university (No. HSEARS20141003001). This study was performed in accordance with relevant guidelines/regulations. Research involving human research participants was performed in accordance with the Declaration of Helsinki.

Informed consent

Informed consent was obtained from all participants.

Additional information

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