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Collective resilience in the disaster recovery period: Emergent social identity and observed social support are associated with collective efficacy, wellbeing, and the provision of social support

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Abstract

Social support and an emerging sense of community are common in flooding, but post-flood group dynamics have not been fully addressed. In the context of a flooded community, we explore how social identification with one's community emerges and affects wellbeing, collective efficacy, and social support. Results from a quantitative survey show that social identification was positively associated with common fate, collective efficacy, and wellbeing through residents' expectations of support and shared goals. Importantly, social identification and disaster exposure interacted: For flooded residents, observing support was associated with providing support regardless of levels of social identification. For unaffected residents there was no association between observed and provided support, regardless of levels of social identification. However, for indirectly affected residents observing support was associated to providing support but only when they highly identified with the community. We argue that structural factors should also be considered when exploring the effects of group membership.

Keywords: social identity; community resilience; social support; disasters; flooding; collective resilience

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Introduction

Climate change is increasing the prevalence and intensity of extreme weather-related events such as flooding, storms, droughts, heatwaves, and hurricanes (Committee on Climate Change, 2016; UNISDR, 2015), which negatively affects physical and mental health (Costello et al., 2009; Hayes et al., 2018; McMichael et al., 2014). One strategy to mitigate the impacts of climate change is to enhance community resilience (UNISDR, 2015; World Health Organization and Public Health England, 2017), two core elements of which are community action and empowerment (Norris et al., 2008). In social psychology, researchers have drawn on the social identity approach to account for the psychosocial processes that underlie collective behaviour in disasters (Drury, 2018; Drury et al., 2019; Ntontis et al., 2019). To our knowledge, most social psychological studies have focused on collective behaviour *in the immediate context* of the extreme event (e.g., during or directly after the disaster; e.g., Drury et al., 2016; Drury et al., 2009b; Ntontis et al., 2018a). However, the recovery period that follows extreme events can last for months or years following the main impact subsiding (e.g., after floodwaters recede) (Medd et al., 2010; Pitt, 2008) and affect mental health in the months and years that follow (Jermacane et al., 2018; Stanke et al., 2012).

Social identity can be a source of social support and wellbeing (Jetten et al., 2017), therefore, in this paper, we examine social identity processes during two years after disasters. The study reported here is a quantitative examination of social identity processes in the city of York following a severe flood that occurred in the period between December 2015 – January 2016. Our dataset comprises three cross-sectional surveys collected 8, 15, and 21 months after the flood. First, we aimed to develop the *social identity model of collective psychosocial resilience* (Drury, 2018; Drury et al., 2019) by testing the relationship between social identity and collective efficacy and wellbeing during the recovery period that follows an extreme event. Second, we incorporated in our analysis mediating (shared goals) and outcome (psychosocial wellbeing) variables that have been theoretically postulated (see Drury, 2018) but have yet to be empirically tested. Third, provision of social support in disasters can be a function of shared social identity as well as of people observing others providing social support (Drury et al., 2016). Considering the differential impact of flooding in communities, we explored whether and how the relationship between observing social support, providing social support and social identification can vary for residents who were exposed to the floods in different ways.

Emergent communities in extreme events: A social identity account

Disasters can impact individual people as well as cause severe dislocation to the wider community (Erikson, 1976; Kaniasty & Norris, 1999; Norris, 2002). However, they can also be characterised by an emerging sense of camaraderie and the presence of social support (Fritz & Williams, 1957; Kaniasty, 2020; Quarantelli, 1999; Solnit, 2009). These processes can protect people's mental health and become a source of community resilience (Norris et al., 2008). Increased community embeddedness can have protective qualities during disaster response and recovery phases (Greene, Paranjothy, & Palmer, 2015; Kaniasty, 2020) such as by reducing post-disaster depression and avoidance (Norris et al., 1999). Groups that emerge

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in disasters have been described as ‘altruistic communities’ (Barton, 1969) or ‘therapeutic communities’ (Coates, 2010; Fritz, 1965/1996) among other terms. The emergence of disaster communities has been attributed to survivors experiencing a shared sense of common fate (Clarke, 2002; Fritz, 1996; Fritz & Williams, 1957; Kaniasty & Norris, 1999), which can increase altruism and prosocial behaviours (Vollhardt & Staub, 2011; Vollhardt, 2009).

Researchers drawing on self-categorization theory in social psychology (Turner et al., 1987) have argued that common fate by itself cannot explain emergent supporting behaviour (cf. Neville & Reicher, 2018; Turner, 1985), pointing to sharing social identity as the underlying psychological mechanism. For instance, in the context of protests and riots, participants can experience common fate due to indiscriminate violence from an outgroup (e.g., police), which then gives rise to a shared social identity (Reicher, 1996). Along similar lines, the social identity model of collective psychosocial resilience (Drury, 2018) argues that, in the context of disasters, it is the extreme event itself that operates as the ‘other’ in relation to which a sense of common fate and a subsequent shared social identity can develop. Shared social identity can, in turn, lead to relational transformations such as increases in expectations of support from fellow group members and motivation to provide social support, as well as cognitive transformations such as orienting survivors towards shared goals and enhancing perceptions of collective efficacy, the perceived ability to coordinate and respond collectively to the disaster (Drury, 2018). The model is embedded within the ‘social cure’ approach in social psychology, which focused on the benefits of group membership for wellbeing (see Haslam et al., 2018; Jetten et al., 2017; Wakefield et al., 2019). For instance, identification with one’s community following an earthquake has been found to mediate the relationship between earthquake exposure and post-traumatic growth (Muldoon et al., 2017).

Analyses of a range of disasters and mass emergencies including football stadium disasters, fires, sinking ships (Drury et al., 2009a) and the 2005 London bombings (Drury et al., 2009b) showed that common fate was associated with the emergence of a shared social identity among survivors, which, in turn, was linked to increased helping behaviours and risk taking among survivors. Additionally, in the context of the 2010 Chile earthquake, common fate was positively correlated with social identification. In turn, social identification was associated with higher expectations of support and higher perceptions of collective efficacy (Drury et al., 2016). Interviews with residents of a flooded community have shown that common fate gave rise to a shared community identity among residents, facilitating interactions between people who shared a geographical location but had no pre-existing relations (Ntontis, 2018; Ntontis et al., 2018a). However, emergent communities do not persist indefinitely following a disaster (Fritz & Williams, 1957). Following a flood, shared social identity can decline due to a lack of common fate or because of the reinstatement of negative intergroup relations. In the aftermath, the lack of a unifying factor, such as widespread exposure and a sense of common fate, fragmented the sense of unity experienced during the disaster itself (Ntontis et al., 2020). The decline of emerging shared social identity could potentially explain why the strong civil responses observed in other flooding events in the UK diminished over time (Forrest et al., 2019). However, social identity can also be maintained through an enduring sense of common fate, the presence of post-disaster

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problems, the ongoing provision of social support, or intentionally through commemorations (Ntontis et al., 2020). Especially regarding commemorations, people's relationships and a sense of belonging to particular spaces can be enhanced through rituals that celebrate a successful recovery, affirming the existence of a psychological as well as place-based community (Ntontis et al., 2020). Place attachment can generate comfort and security, facilitate personal growth and a sense of belonging, and enhance wellbeing (Scannell & Gifford, 2017).

Social support and social identity in disasters

Emergent disaster communities are linked to solidarity and providing social support. Increases in prosocial behaviours are positively associated with higher levels of residential devastation and, despite decreasing over time, their post-disaster baseline levels have been shown to be higher compared to pre-disaster levels (Rao et al., 2011). Exposure to disasters has been associated with depression both directly through immediate personal losses, as well as indirectly through people's experiences of deterioration of social support and community embeddedness (Kaniasty & Norris, 1993). However, receiving social support can increase survivors' perceptions of its availability and mitigate negative effects on mental wellbeing (Norris & Kaniasty, 1996). After disasters, wellbeing was also better for people who engaged more in and perceived higher levels of social support from altruistic communities. On the contrary, dissatisfaction with social support received in the post-disaster period as well as lack of engagement in community activities predicted worse wellbeing (Kaniasty, 2012).

One psychological mechanism that underpins providing social support in disasters is social identity. People are more likely to offer as well as receive support from ingroup rather than outgroup members (Haslam et al., 2009; Levine et al., 2005). For example, donations to disaster victims increase when donors perceive themselves as sharing an identity with survivors (Zagefka & James, 2015). Similarly, following an earthquake in Chile, national identity was associated with providing support for people affected (Maki et al., 2019). The provision of social support towards other groups can also vary depending on the type of disaster exposure that survivors themselves have experienced. Following Cyclone Pam in Vanuatu, Vardy and Atkinson (2019) found that experiencing greater property damage can lead to prosocial behaviours towards participants' ingroup members, whereas exposure to other people in distress can lead to increased prosocial behaviours towards both ingroup and outgroup members.

Importantly, behaviours may also be guided by observing how other people act (Gigerenzer, 2008). During disasters, people can be mobilised to provide social support by observing how other people react to the disaster and respond towards others. Social identification in this case can operate as a moderator since we are more likely to use other people's behaviours as guide for own own actions to the extent that we perceive them as ingroup members (Reicher, 1984; Turner; 1982; Turner et al., 1987). Following the Chile earthquake in 2010, Drury et al. (2016) found that provision of collective and emotional support was predicted by social identification. Moreover, social identification moderated the relationship between observing and providing social support, with people providing more support when they highly identified with their community.

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The present study: Aims and predictions

Previous social psychological research has focused on social identity processes that underpin groups that emerge in the immediate disaster context (e.g. Drury et al., 2016, 2009b; Ntontis et al., 2018a). Research on social identity processes during the months that follow a disaster is limited and has only used small samples and qualitative designs (e.g., Ntontis et al., 2020). However, more research in this area is important for a number of reasons. Flooding and other extreme events are becoming more prevalent and more intense (Committee on Climate Change, 2016; Few, 2007; UNISDR, 2015) and can have severe, long-lasting physical and psychosocial impacts (Fernandez et al., 2015; Stanke et al., 2012; Waite et al., 2017). Events such as flooding have the potential to affect large numbers of people (WHO Regional Office for Europe, 2013) and are often followed by protracted recovery periods (Pitt, 2008). However, shared social identities can operate as sources of wellbeing, mobilise social support (Haslam et al., 2018; Wakefield et al. 2019), and become sources of community resilience (Ntontis et al., 2019). Hence the effects of shared social identity in the recovery period after disasters are worthy of further examination.

Our first aim was to test whether social identity processes operate in the recovery period of a disaster, which can last months if not years (Pitt, 2008). In line with the social identity model of collective psychosocial resilience, we predicted that *common fate* would positively predict *social identification* with one's community, explaining the emergence of disaster communities (Drury, 2018; Drury et al., 2019). In turn, social identification would be positively related to positive psychosocial outcomes such as *collective efficacy* and *wellbeing* (see Figure 1). Additionally, we hypothesised that the relationships between shared social identification, collective efficacy and wellbeing would be mediated by *expected support* and *shared goals*. Expected support is a consequence of the relational transformation that underpins the emergence of shared social identity in extreme events, with people coming to expect support from others they perceive as ingroup members (Drury, 2018). Expectations of support from fellow group members are then likely to be associated with increased collective efficacy (Drury et al., 2016) and psychological wellbeing (Jetten et al., 2017). Shared goals are a consequence of the cognitive transformation that underpins the emergence of shared social identity. Perceiving the self as part of a social category can shift one's perspective towards collective values and orientation, being associated with increased perceptions of collective efficacy and psychosocial wellbeing (Drury, 2018; see Jetten et al., 2017).

----- insert Figure 1 here -----

We are also interested in the relationship between disaster exposure, social identity, and provision of social support. Social support can be mobilised through shared social identification (Jetten et al., 2017) as well as through observing and using other people's behaviours as a way of guiding our own (Gigerenzer, 2008). Importantly, the relationship between observing and providing social support in disasters can be affected by shared social identification – we engage in behaviours that we observe others doing to the extent that we identify highly with them (Drury et al., 2016). However, despite the fact that disaster

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exposure is positively associated with increases in people providing social support (Rao et al., 2011), how differential disaster exposure can affect the relationship between social identity and observing and providing social support has not been addressed. There are various types of disaster exposure. Bolin (1985) distinguishes between primary and secondary survivors – the former experience the impact of the disaster directly through immediate loss and psychosocial impacts, whereas the latter may live in the surrounding disaster area but might not have suffered the direct effects. Crucially, secondary survivors are not impervious to the impact of disasters. Unaffected but nevertheless disrupted residents, for instance, are at risk of experiencing anxiety and post traumatic stress disorder following flooding (Jermacane et al., 2018; Waite et al., 2017). Considering the differential impact of extreme events, we were interested in the relationship between observing and providing social support, as well as how it can vary based on structural factors such as disaster exposure (e.g., being flooded, indirectly affected, or completely unaffected) and shared social identification. Based on previous research, we hypothesised that there would be a positive relationship between observing and providing social support (Drury et al., 2016). Also, observing and providing social support would be moderated by social identification in that only those people who highly identified with the community would use other group members' behaviour to guide their own. A novel aspect of our study is the incorporation of disaster exposure in the aforementioned moderation. Social support in flooding can be provided to those affected by affected, indirectly affected, and unaffected residents (Ntontis et al., 2018a). Considering the above, we hypothesized that participants across the three exposure groups (flooded, indirectly affected, unaffected) would provide social support when they observed it, and *only when* shared social identity with the community was at mean or high levels.

Method

Background: The Floods in York, UK in 2015

Between late December 2015 and early January 2016, the UK was severely hit by Storm Eva. The storm led to severe flooding in the wider area of York (NHS England North, 2015). Flood warnings for York were issued by the Environment Agency from December 23, and the city was hit on December 24. The rainfall was so intense that, on December 26, the water almost entered the control room of the River Foss barrier. The Environment Agency was forced to lift the floodgate to prevent loss of control over the barrier due to electrical damage, and that action resulted in the surrounding area being flooded. Around 350 houses and 157 businesses were reported as internally flooded, 250 residents were evacuated, and the local traveller community in York was also heavily affected. A multi-agency response was initiated by the City of York Council, York Water, the Environment Agency, Fire and Rescue Services, Mountain and Rescue teams, and North Yorkshire police (City of York Council, 2016). Many volunteers participated in the response, including 250 residents and 25 volunteer groups; they assisted in gathering and giving out donations, cleaning, and filling sandbags. The coordination was also enhanced through a Facebook group set up immediately after the floods. The group attracted around 15,000 members and became the basis for identifying people's specific needs and providing support. The City of York Council also provided some tax exemptions for the affected households and businesses after the event.

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In July 2017, 18 months after the floods (and between the second and third survey sessions of the present study), there were reports of affected residents seeking mental health support from Citizens Advice York, to cope with the flood damage (Yorkmix, 2017). The first author contacted the City of York Council and asked for information regarding the present situation. He was informed that evacuated residents returned to their households within 15 months after the incident, and that tax exemptions would be over by March 2018. He was also told that the Major Incident Response Team provided practical and mental health support for approximately 150 residents.

Data collection process and participant details

Ethical approval for the study was obtained from the Cross Schools Research Ethics Committee of the University of Sussex. Our target population was identified through a set of postcodes held by the, then, Department of Communities and Local Government (DCLG), and every postcode included at least one affected property. After obtaining the postcodes, the Extreme Events team of Public Health England extracted for us the addresses that corresponded to each postcode. Our final database consisted of 2,959 properties, some of which were affected during the 2015 floods. However, we learned that no record had been kept that listed only the affected households, so we decided to survey the occupants of all 2,959 properties. Each household received one envelope which contained two questionnaire surveys, one freepost return envelope, and an information sheet. A link was also included in the surveys and information sheet, through which participants could fill in the survey online.

The study consisted of three survey sessions. The first session was carried out in September 2016, almost eight months after the floods. Ideally, we would have sent out the questionnaires as close to the floods as possible. However, we decided not to do so, because we became aware (through personal communication with local people as well as multiple visits to the area) that many flooded residents had not yet returned to their houses. In the first session, we sent survey questionnaires to all 2,959 houses by Royal Mail. A one-page letter was mailed to the same addresses two weeks later reminding participants to fill in the paper survey. That communication also directed recipients to an online link as an alternative. The first questionnaire was fully completed by 217 respondents (7% response rate). The sample included 27 unaffected participants, 115 indirectly affected (who resided around the flooded area and faced minor disruption without water entering their houses), 70 people who had suffered flooding, and five whose flood status was not reported.

We conducted the second survey in April 2017, almost seven months after the first survey session and 15 months after the floods. We decided to change our sampling strategy for this second session to see whether the change would increase the response rate. The first author and an assistant visited all households included in DCLG's list of postcodes and delivered questionnaires door-to-door. Participants who were in their homes and who agreed to fill in the survey were informed that they could do so at their own pace, and a suitable day was agreed on when the researchers would pick up the questionnaires. If participants were not at home, the survey material was delivered through their letterboxes. The second survey was fully completed by 184 residents (6% response rate), 56 of whom had also completed the

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first session. In total, 35 were unaffected, 82 were indirectly affected, and 62 were flooded. The flood status of five participants was unknown.

In the third session, we sent questionnaire surveys to all 2,959 households through the Royal Mail and a reminder letter two weeks later containing the online link for the survey. The third survey session was conducted in September-October 2017, almost 6 months after the second survey and 21 months after the floods. It was fully completed by 136 participants (4% response rate). Of these, 25 were unaffected, 73 were indirectly affected, 37 had experienced being flooded, and the flood status of 1 participant was unknown. Moreover, 50 participants had previously completed the survey at both sessions 1 and 2.

The survey was anonymous. Participants were only identified through a unique identifier consisting of participants and their parents' initials, followed by the number of their day of birth (e.g. XX-YY-ZZ-30), which we inserted on the first page of the questionnaires.

Prior to the analysis, we tested whether the three survey populations differed on demographic characteristics. Fisher's exact test to calculate the chi-squares for the distribution of demographic variables showed no difference in gender, $\chi^2(2) = 0.01, p = .99$, years of residence in the community $\chi^2(6) = 9.56, p = .13$, relationship status $\chi^2(6) = 6.82, p = .30$, flood insurance $\chi^2(6) = .694, p = .31$, or education $\chi^2(8) = 2.49, p = .88$ across the three samples.

Measures

We summarise the self-report measures included in the survey. Using an exploratory factor analysis, items loaded on a single factor for their respective scales.

Flood status

To measure participants' flood status we used an item that split participants into 3 categories: a) those who were unaffected by the floods; b) those who were indirectly affected and faced temporary disruption due to problems with gas, electricity and Internet or difficulty in moving around; and c) those who had water enter their house (Tempest, et al., 2017; Waite et al., 2017).

Common fate

Four items were used to assess participants' perceptions that everyone affected by the floods was in a similar position and faced similar problems during the floods (e.g., "*People affected by the flood are all in a similar situation*"). The items were based on those used in previous research (Drury, Brown, González, & Miranda, 2016; Drury, Cocking, & Reicher, 2009a, 2009b), and were measured on a 1 "*Disagree Strongly*" to 7 "*Agree Strongly*" Likert-type scale (Survey 1: $\alpha = .91$, Survey 2: $\alpha = .91$, Survey 3: $\alpha = .91$).

Social identification

We used four items adapted from Alnabulsi and Drury (2014) and Khan et al. (2015) to assess the extent to which participants identified with other members of their community, (e.g., "*I have a feeling of unity with other residents of the community*"), which were

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measured on a 1 “Disagree Strongly” to 7 “Agree Strongly” Likert-type scale (Survey 1: $\alpha = .91$, Survey 2: $\alpha = .93$, Survey 3: $\alpha = .91$).

Expected support

We used three items to measure the extent to which participants expected support from other community members. One item was adapted from Alnabulsi and Drury (2014) (e.g., “*If I need help, other community members would support me*”) and two were our elaborations through previous interview studies (e.g., “*I can count on members of my community to meet my needs if things go wrong*”, “*Members of my community will listen to my concerns if I talk to them*”) (Ntontis et al., 2018a). The items were measured on a 1 “Disagree Strongly” to 7 “Agree Strongly” Likert-type scale (Survey 1: $\alpha = .91$, Survey 2: $\alpha = .93$, Survey 3: $\alpha = .91$).

Shared goals

We used three items to assess the extent to which residents shared common goals and objectives in relation to the floods. The items were our own elaborations as well as being based on the research by Chow and Chan (2008) and the theoretical model suggested by Drury (2012; 2018) (e.g., “*Other community members and I share the same ambitions and vision for the recovery of the community from the flood damage*”). The items were measured on a 1 “Disagree Strongly” to 7 “Agree Strongly” Likert-type scale (Survey 1: $\alpha = .92$, Survey 2: $\alpha = .91$, Survey 3: $\alpha = .91$).

Collective efficacy

We used three items to measure the extent to which people felt they could deal collectively with the disaster. They were adapted from Drury et al. (2016) and van Zomeren, Spears, Fischer, & Leach (2004) (e.g., “*Together with other community members, we are able to change the situation*”). The items were measured on a 1 “Disagree Strongly” to 7 “Agree Strongly” Likert-type scale (Survey 1: $\alpha = .82$, Survey 2: $\alpha = .85$, Survey 3: $\alpha = .87$).

Observed collective support

We used four items adapted from Drury et al. (2016) to measure how many times participants saw other people providing support in a coordinated way and asked them how many times they saw such behaviours occurring (e.g., “*coordinate how help is provided*”, “*assist in cleanups of properties and public areas*”). We used a 5-point scale consisting of the following responses: “*Never*”, “*1 time*”, “*2 times*”, “*3 times*” and “*4 times or more*” (Survey 1: $\alpha = .87$, Survey 2: $\alpha = .88$, Survey 3: $\alpha = .88$).

Provided collective support

We used four items adapted to measure how many times participants provided support together with others. They were adapted from Drury et al. (2016) (e.g., “*assist in clean-ups of properties and public areas*”). We used a 5-point scale consisting of the following responses: “*Never*”, “*1 time*”, “*2 times*”, “*3 times*” and “*4 times or more*” (Survey 1: $\alpha = .78$, Survey 2: $\alpha = .81$, Survey 3: $\alpha = .79$).

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Psychosocial wellbeing

We used the 8-item Flourishing Scale developed by Diener et al. (2010) to measure psychosocial wellbeing. It assesses participants' perceived success in areas including self-esteem, relationships, and optimism. The items were measured on a 1 "Disagree strongly" to 7 "Agree strongly" scale (Survey 1: $\alpha = .89$, Survey 2: $\alpha = .92$, Survey 3: $\alpha = .87$).

Data processing and analytical procedure

Due to the low response rate in the first session and the high attrition rates and subsequent small number of repeated participants, we used a cross-sectional rather than longitudinal design. We removed from the databases for the three survey sessions those participants who appeared more than once. As a result, we removed from session 2 the participants who took part in session 1 and removed from session 3 the participants who appeared in session 1 and/or session 2, removing 106 participants in total. This procedure left us with a total sample of 431 participants – 217 participants for session 1, 128 participants for session 2, and 86 participants for session 3. Of those, 64 were unaffected, 203 were indirectly affected, and 153 were flooded (11 residents did not report their flood status).

To examine the antecedents and effects of social identification we carried out a path analysis using Mplus 6.12 (Muthén & Muthén, 2012) using the Maximum Likelihood Robust estimation method. In our analysis we controlled for the effects of survey sessions as well as for participants' flood status.

Our second analysis focused on whether social identification would moderate the relationship between observing and providing social support, as well as whether this moderation would vary based on participants' flood status. We used the PROCESS v3.4 macro (Model 3) in SPSS (Hayes, 2018) to run a moderated moderation analysis. All continuous variables were automatically centered with PROCESS and we used 5,000 bootstrap samples. Observing collective support was used as the independent variable, provided collective support as the dependent variable, social identification as the moderator of the relationship between the independent and dependent variables, and flood status as a multi-categorical moderator on social identification. Common fate and survey session were added as covariates in this model. We used the Helmert method (Hayes & Montoya, 2017) to code groups in our multi-categorical moderator¹.

Results

First, we present the antecedents and effects of social identification on collective efficacy and wellbeing, followed by the roles of social identification and flood status as moderators of the relationship between observed and provided collective support. Table 1

¹ We could have used a traditional dummy coding system whereby the non-flooded group would be used as a reference against which we could compare the flooded and indirectly affected groups respectively. However, this would only allow us to quantify differences between the non-flooded and flooded group and between the non-flooded and indirectly affected groups. The Helmert method allowed us to explore whether the moderating effect of social identification on the relationship between observing and providing social support would be affected by: a. having experienced any type of exposure to the flood (flooded and indirectly affected) vs. being completely unaffected; and b. being more severely flooded (vs. indirectly affected).

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contains the descriptive statistics and correlations of our combined cross-sectional sample. The tables show that the standard deviations for all items are different to zero, with an acceptable level of response variability. All correlations were in the predicted positive direction. There was a small to medium correlation between common fate and shared social identity that was smaller compared to previous studies (Drury et al. 2016). We expected this finding on the basis of the temporal distance from the extreme event. As in previous studies (Drury et al. 2016), there was a strong association between shared social identity and expected support and a medium correlation between shared social identity and collective efficacy. Shared social identity was also strongly correlated with shared goals and there was a weaker, albeit significant, correlation with wellbeing. As in previous research (Drury et al., 2016), the association between observed social support and providing social support was high and was higher than social identification and providing collective support.

-----Insert Table 1 here-----

Part 1: Antecedents of social identification and its effects on collective efficacy and psychosocial wellbeing

The path model showed adequate levels of fit, $\chi^2(6) = 14.72, p = .020, CFI = 0.98; RMSEA = .059$ [90% C.I. 0.02 – 0.09]; SRMR = .02. In line with our predictions, common fate was positively associated with social identification ($\beta = .27, p < .001$). Social identification positively predicted shared goals ($\beta = .50, p < .001$) and expected support ($\beta = .62, p < .001$). Collective efficacy was predicted by both expected support ($\beta = .30, p < .001$) and shared goals ($\beta = .18, p = .003$). Psychosocial wellbeing was predicted by both expected support ($\beta = .16, p = .007$) and shared goals ($\beta = .17, p = .002$). Moreover, there was a significant indirect effect from common fate to collective efficacy ($\beta = .07, p < .001$) through both expected support ($\beta = .05, p < .001$) and shared goals ($\beta = .02, p = .017$). Similarly, there was an indirect effect from common fate to wellbeing ($\beta = .05, p = .001$) through both expected support ($\beta = .02, p = .020$) and shared goals ($\beta = .02, p = .015$). Social identification accounted for 8% ($p = .002$), expected support for 39.1% ($p < .001$), shared goals for 25.5% ($p < .001$), collective efficacy for 18.9% ($p < .001$), and psychosocial wellbeing for 8.7% ($p = .008$) of the variance in the model. The model is depicted in Figure 2.

-----Insert figure 2 here-----

Part 2: Observed collective support as predictor of provided collective support, and the moderating roles of social identification and flood status

We tested the moderating role of social identification on the relationship between observed collective and provided collective support, as well as the additional moderating role of participants' flood status. The results are presented in Table 2.

-----Insert table 2 here-----

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Observing collective support was positively related to providing collective support ($\beta = .29, p < .001$). Observing collective support was also a stronger predictor than social identification in the model, which did not operate as an independent predictor of providing collective support ($\beta = .05, p = .113$). The difference in provision of collective support between residents who sustained some flood damage (indirectly affected and flooded) vs. those who were completely unaffected was marginally significant ($\beta = .22, p = .053$), but flooded participants reported providing more collective support compared to those indirectly affected ($\beta = .14, p = .049$). The interaction of observing collective support and social identification between unaffected residents vs. those with some level of exposure (indirectly affected and flooded) in providing collective support was not significant ($\beta = -.08, p = .401$). Common fate ($\beta = .03, p = .070$) and survey session ($\beta = .06, p < .160$) were not significant predictors of provided collective support in the model. However, when comparing whether social identification moderated the relationship between observing and providing collective support and whether this moderation varied across flooded and indirectly affected residents, the interaction was significant ($\beta = -.17, p = .006$). More specifically, shared social identification had an effect on the indirectly affected residents ($\beta = .11, p = .018$) but not the unaffected ($\beta = .11, p = .250$) or flooded ($\beta = -.06, p = .140$) residents. The interaction was further probed by performing a simple slopes analysis. We tested the conditional effects of social identification at three levels – one standard deviation below the mean, at the mean, and one standard deviation above the mean – while considering the simultaneous moderating effects of participants' flood status at three levels (unaffected, indirectly affected, flooded).

-----Insert table 3 here-----

Our results (see Table 3 and Figure 3) show that there was no interaction between observing collective support and social identification for unaffected residents. Their joining in collective supportive efforts when observing others doing so does not appear to be a function of low ($\beta = .06, p = .478$), mid, ($\beta = .22, p = .095$) or high ($\beta = .38, p = .137$) social identification with the community. However, there was an interaction between the two variables for those people who were indirectly affected. Collective support was more likely to be offered when they saw others providing collective support *as well as* being highly identified with the community. Thus, whereas low identifiers did not provide collective support when they observed it ($\beta = .12, p = .121$), indirectly affected residents at mean ($\beta = .28, p < .001$) and high ($\beta = .44, p < .001$) levels of identification provided collective support when they saw others acting in the same manner. Contrary to our expectations, there was no interaction between observing collective support and social identification for flooded residents. People reported offering collective support when they observed it regardless of low ($\beta = .45, p < .001$), mean ($\beta = .37, p < .001$), or high ($\beta = .28, p < .001$) levels of identification with their community.

-----insert figure 3 here-----

Social identification in flooding

Discussion

In disasters, communities can often emerge in absence of any pre-existing bonds among survivors (Fritz & Williams, 1957; Solnit, 2009). The emergence of collective behaviour and the mobilisation of solidarity and social support in absence of pre-existing bonds can be explained through social identification based on perceived common fate among survivors, with findings coming from a range of contexts including earthquakes, bombings and fires among others (see Drury, 2018; Drury et al., 2019). Empirical evidence shows that similar social identity processes also operate in flooding. Despite flooding often affecting geographically established communities, disaster communities can also emerge in the absence of pre-existing bonds (Ntontis et al., 2018a). However, communities are often defined in geographical terms (Norris et al., 2008), which is also reflected in official guidance documents (e.g., Cabinet Office, 2019). In our opinion, this neglects psychological communities that can emerge during disasters and operate over and above geographical boundaries (Ntontis et al., 2018b).

In this study, we explored whether social identity processes operate during the recovery period in the months that follow a disaster. Our analysis shows that the social identity principles may play a role, to some extent, in facilitating wellbeing and collective efficacy. Such effects operate through community members sharing goals and expecting support from fellow group members. Temporal distance from the disaster as well as participants' flood status had no effects in our first model, showing that, potentially, these processes can apply to the wider community (vs. just those people who were affected) and can extend beyond the immediate disaster context and well into the months and years that follow during the recovery period.

A novel aspect of our study is the exploration of whether social identity and disaster exposure interact in relation to people observing and providing social support. In other words, *who provides social support when they observe it, and does social identity matter?* Survivors can provide support when they observe others doing so, potentially due to inferring the presence of social norms related to people acting collectively to provide social support (Drury et al., 2016). Our analysis extends previous findings by showing that social identity can interact with disaster exposure in mobilising people to offer social support when they observe others doing so. For example, flooded participants provided collective support when they observed it regardless of their levels of social identification. Thus, for people directly affected by a disaster, other people's behaviour can become a source of influence in absence of a psychological group. The range of options for participants who are directly exposed to a disaster is rather limited and, perhaps, they are forced to engage in collective efforts when they observe others doing so, regardless of feelings of togetherness with others. Unaffected participants were not likely to provide social support when they observed it, regardless of their levels of social identification. But social identification played a key role in mobilising collective support when the latter was observed in the case of indirectly affected residents. We hypothesise that this occurs because indirectly affected residents are likely to reside close to the affected areas and are exposed to the impacts of the flood even if their own homes were not inundated. This gives them the opportunity to witness others providing support for people who are affected as well as opportunities to engage in the efforts made. Psychological factors

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such as high levels of social identification can have an effect when indirectly affected residents engage in behaviours that signify solidarity.

We carried out further analyses to rule out alternative explanations. Common fate could potentially explain differences in the relationship between observing and providing social support, so we controlled for its effects, but the variable was not a significant predictor. Thus, the relationship between observing and providing social support and exposure was not affected by perceptions of sharing a common fate with others but, more likely, due to psychological connectedness with the group. We also explored whether different predictors affected provision of social support for different exposure groups. However, multiple regression analyses showed that observing support was a stronger predictor of providing social support compared to shared social identification across all three exposure groups. Furthermore, shared social identification was a significant predictor of providing support only for indirectly affected residents but not for those flooded or indirectly affected. Thus, engagement in providing support was primarily driven by observing others giving support, with shared social identification only mobilising indirectly affected residents.

One limitation of this study is that it uses an aggregate sample that consists of three different cross-sectional surveys conducted at different timepoints during the months that followed the flood. In our analysis, we controlled for the different survey sessions, but future research should use large cross-sectional samples as well as replicate our results in prospective models. Time could also affect participants' memories and subsequently cause distortions in the data. Surveys were conducted between 8 and 21 months following the disaster, so it is possible that responses in the frequency of observed and provided support could be distorted. Also, people at higher levels of wellbeing potentially could have more positive recollections of social cohesion and support compared to people who have lower wellbeing, so future studies could collect observational data as well as self-reported measures as close to the disaster as possible. Another issue concerns the items used to measure social identification, which could reflect a pre-existing community identification. Future research should use items that specifically address social identification with the community both before and after the disaster, since they might be more useful in addressing the emergent nature of disaster groups. Our participants were also self-selected, which could have biased our sample towards including more community-oriented residents. The fact that our data shows variability shows that this might not be the case, but future research should use other types of data (e.g. census). Nevertheless, disasters are extremely difficult contexts to conduct empirical research on and we had to rely on opportunity sampling by testing two different methods of data collection. Finally, attachment to one's place and community can be important for wellbeing, disaster coping, and risk perception (Bonaiuto et al., 2016). Social identities in flooding can be sustained through commemorations and facilitate a sense of community belonging and attachment (Ntontis et al., 2020). We recommend further exploration of how prior place attachment might be related to social identity processes in the post-disaster period. Similarly, the relationship between community identification, place attachment, and support for flood defences (e.g., Clarke, 2018) is also worth exploring.

To conclude, we show that social identity processes operate in the months and years following a disaster and can contribute to the maintenance of psychological communities.

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Social identity operates through enhanced wellbeing, increases and collective efficacy and expectations of support, and the alignment of goals, all of which are crucial in recovering from the adverse effects of extreme events.

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Table 1.

Descriptive statistics and correlations for participants of the combined cross-sectional samples

Variable	M	SD	1	2	3	4	5	6	7
1 Common fate	3.56	1.83							
2 Social identification	4.66	1.38	.26**						
3 Expected support	5.09	1.24	.12*	.62**					
4 Shared goals	4.83	1.16	.24**	.50**	.50**				
5 Collective efficacy	3.89	1.30	.14**	.28**	.39**	.34**			
6 Wellbeing	5.80	0.84	.11*	.21**	.24**	.24**	.18**		
7 Observed collective support	1.12	1.28	.11*	.12**	.13**	.18**	.21**	.12**	
8 Provided collective support	0.43	0.77	.18**	.17**	.10*	.19**	.16**	.09	.54**

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

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Table 2

Interaction between observed collective support, social identification, and flood status on provided collective support.

Predictor	β	SE	p	95% CI	
Observed collective support (OCS)	.29***	.05	< .001	.18	.39
Social identification (SSI)	.05	.03	.113	-.01	.13
(Indirectly affected + flooded) vs unaffected (FS1)	.22	.11	.053	-.00	.46
Flooded vs. indirectly affected (FS2)	.14*	.07	.049	.02	.29
OCS*SSI*FS1	-.08	.10	.401	-.29	.11
OCS*SSI*FS2	-.17**	.06	.006	-.30	-.05

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

Social identification in flooding

Table 3

Conditional effects of social identification (-1SD, M, +1SD) on the relationship between observing and providing collective support at different types of flood status.

Social identification	Flood status	β	SE	<i>p</i>	LLCI	ULCI
-1.37	Unaffected	.06	.08	.460	-.10	.23
-1.37	Indirectly affected	.12	.08	.121	-.03	.28
-1.37	Flooded	.45*	.09	<.001	.27	.65
.00	Unaffected	.22	.13	.095	-.03	.48
.00	Indirectly affected	.28*	.05	<.001	.17	.39
.00	Flooded	.37*	.06	<.001	.24	.49
1.37	Unaffected	.38	.25	.137	-.12	.88
1.37	Indirectly affected	.44*	.09	<.001	.25	.63
1.37	Flooded	.28*	.07	<.001	.13	.43

* $p < .001$

Social identification in flooding

Figure 1.

Hypothesized predictors of social identification and its effects on collective efficacy and wellbeing through expected support and shared goals.

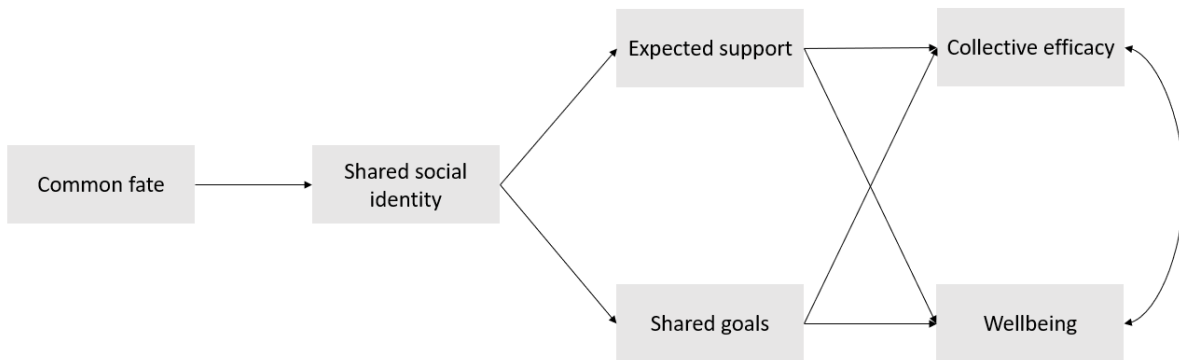
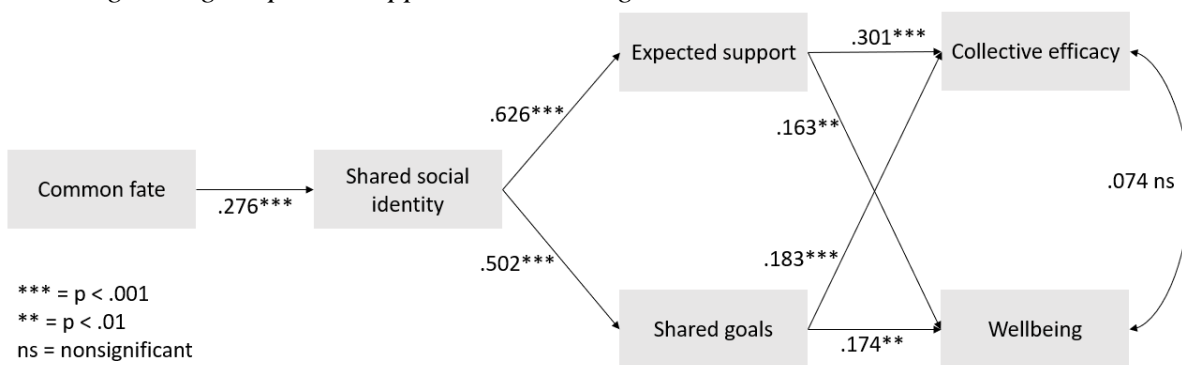


Figure 2.

Test of the predictors of social identification and its effects on collective efficacy and wellbeing through expected support and shared goals.



Social identification in flooding

Figure 3.

Moderating effects of social identification on the relationship between observing and providing collective support for participants of different flood status (left) and at different SDs below and above the mean (right).

