Greater number of group identifications is associated with healthier behaviour: Evidence from a Scottish community sample

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Abstract

Objectives: This paper investigates the interplay between group identification (i.e., the extent to which one has a sense of belonging to a social group, coupled with a sense of commonality with in-group members) and four types of health behaviour, namely physical exercise, smoking, drinking, and diet. Specifically, we propose a positive relationship between one's number of group identifications and healthy behaviour.

Design: This study is based on the Scottish portion of the data obtained for Wave 1 of the two-wave cross-national Health in Groups project. 1824 patients from 5 Scottish General Practitioner (GP) surgeries completed the Wave 1 questionnaire in their homes.

Methods: Participants completed measures of group identification, group contact, health behaviours and demographic variables.

Results: Results demonstrate that the greater the number of social groups with which one identifies, the healthier one's behaviour on any of the four health dimensions considered.

Conclusions: We believe our results are due to the fact that group identification will generally i) enhance one's sense of meaning in life, thereby leading one to take more care of oneself, ii) increase one's sense of responsibility toward other in-group members, thereby enhancing one's motivation to be healthy in order to fulfil those responsibilities, and iii) increase compliance with healthy group behavioural norms. Taken together, these processes amply overcompensate for the fact that some groups with which people may identify can actually prescribe unhealthy behaviours.

Greater number of group identifications is associated with healthier behaviour: Evidence from a Scottish community sample

Researchers from various disciplines agree that participation in the life of one or more social groups (e.g., family, social club, local community, tribe) is a central dimension of human existence (Tomasello, 2014; Tuomela, 2007). As well as being defined by socio-structural and cultural aspects (e.g., size, hierarchies, norms, division of labour, rituals), groups are characterized by a subjective dimension, namely the individual members' sense of *group identification* (Postmes, Haslam, & Jans, 2013), which involves one's sense of psychological connection and shared experience with fellow group members (Tajfel & Turner, 1986).

Group Identification and Health

Researchers adopting a *social identity* perspective to group psychology (Haslam, 2004; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) have demonstrated that group identification has important consequences. Specifically, group identification leads to compliance with group norms (Barreto & Ellemers, 2002), as well as to a predisposition to like (Hogg & Hains, 1996), help (Levine, Prosser, Evans, & Reicher, 2005) and cooperate (Worchel, Rothgerber, Day, Hart, & Butemeyer, 1998) with in-group members. Importantly, in recent years researchers have also found a positive link between group identification and health. This research takes two main forms.

First, greater identification with an in-group appears to be associated with better health outcomes. The bulk of evidence comes from studies of organizations and professional groups. For instance, Sani, Herrera, Wakefield, Boroch, and Gulyas (2012) found that military personnel identifying highly with their army unit were less likely to experience depressive symptoms than those with lower identification. Furthermore, in a longitudinal study of two theatre production teams that took place during preparation for and performance of a production, Haslam, Jetten, and Waghorn (2009) found that higher team identification at the outset predicted lower likelihood of

experiencing burnout during the most demanding phases (i.e., dress rehearsal and performance). Similar effects have emerged for people with multiple sclerosis attending small support groups: greater identification with the support group was associated with lower levels of depression (Wakefield, Bickley, & Sani, 2013). Furthermore, Cruwys et al. (2014) found that identification with either a community recreation group or a clinical psychotherapy group fostered recovery in people with mental health problems.

Second, researchers have found a link between multiple group memberships and health outcomes. For instance, Haslam et al. (2008) found that having multiple group memberships prior to a stroke was associated with greater life satisfaction after the stroke. Similarly, Iyer, Jetten, Tsivrikos, Postmes, & Haslam (2009) found that participants starting university were more likely to develop a university student identity (which in turn improved psychological well-being) to the extent that they belonged to multiple groups before starting university, while Jones et al. (2012) found that forming more new group memberships shortly after head injury was associated with lower post-traumatic stress symptoms three months later. Furthermore, Cruwys et al. (2013) found that a greater number of group memberships in a large sample of English people predicted better recovery from depression, as well as lower risk of relapse. However, it should be noted that this second strand of research tends to focus simply on the number of group memberships one possesses, rather than assessing the extent of one's identification with each of these groups.

The positive impact of group identification on health could be due to multiple reasons. However, special emphasis has been placed on the possibility that stronger group identification increases one's likelihood of receiving moral and instrumental support from other in-group members, thereby reducing the damaging amount of stress associated with everyday problems (Haslam, Reicher, & Levine, 2012).

Group Identification and Health Behaviour

Importantly, however, group identification may impact not only on the psycho-physiological mechanisms that affect health, but also on health practices and behaviours (Haslam, Postmes, Jetten, & Haslam, 2009). The most obvious way in which this can happen has to do with one's motivation to adhere to the group's norms. Specifically, since there is a positive relationship between group identification and adherence to group norms, strong group identification implies a greater tendency to comply with health-related group norms (e.g., drinking, smoking, eating, and exercise behaviours).

Researchers have provided plenty evidence to support this assumption. For instance, a longitudinal interview study involving pre-adolescents from economically-deprived areas of Northern Ireland revealed that smoking uptake was predominantly driven by individuals striving to conform to the normative behaviour of the peer group with which they identified (Stewart-Knox et al., 2005). Quantitative studies have confirmed and extended these findings. In a longitudinal investigation involving a large sample of young Australian adults, Schofield, Pattison, Hill, and Borland (2001) found that smoking behaviour was strongly associated with favourable smoking norms in one's peer group. However, the impact of favourable group norms on smoking was stronger amongst those who strongly identified with the group (compared to those who identified less strongly). Similar effects have been found with regard to other types of health behaviour. For instance, Terry and Hogg (1996) found that high levels of identification with the group 'friends and peers at university' positively influenced Australian students' intentions to engage in regular exercise and sun-protective behaviour, as these actions were seen as normative for members of the group. Concerning food consumption, a study involving young Norwegian adults showed that leisure group norms influenced intentions to eat healthy food among participants with high group identification, but not among those with low group identification (Åstrøm & Rise, 2001). Regarding drinking behaviour, a study involving university students in the UK, for whom heavy drinking is normative,

revealed that greater identification with the group 'UK university students' was associated with stronger drinking intentions (Livingstone, Young, & Manstead, 2011). Clearly, these findings imply that group identification may prompt either healthy or unhealthy behaviours, depending on the nature of the health behavioural norms of the group with which one identifies.

However, there are at least two other ways in which group identification may influence health behaviour. First, stronger group identification may produce a greater sense of purpose and meaning in life. This is likely to make one feel that life is worth living, thereby increasing one's motivation to take care of oneself. Supporting this idea, a study involving a large sample of Romanian adolescents revealed that greater meaning in life reduced risky behaviours such as unsafe sex, use of illicit drugs, and poor diet (Brassai, Piko, & Steger, 2011). Similarly, Nicholson et al. (1994) found that individuals receiving treatment for drug abuse had lower levels of purpose and meaning in life than a matched sample of non-drug abusing individuals.

Second, researchers from various fields have pointed to the fact that social ties and networks tend to produce obligations towards others, which may not be met satisfactorily unless one is in good health (Durkheim, 1897/2002; Umberson, Crosnoe, & Reczek, 2010; Waite & Gallagher, 2000). Therefore, we can assume that greater group identification will enhance one's motivation to stay healthy in order to contribute to the group, and to avoid becoming a burden in the context of the group's pursuit of good performance (as in a sports team), high productivity (as in a work-place), or group members' wellbeing (as in a family/group of friends). In other words, stronger group identification may imply an enhanced sense of responsibility toward the group, and an associated effort to be healthy in order to fulfil those responsibilities and not to inadvertently sabotage the group's goals.

These two additional pathways clearly imply a positive impact of group identification on health behaviour. It is therefore legitimate to assume that, overall, strong group identification will be associated with adoption of healthier behaviours.

Aims

The core aim of this paper is to investigate the assumption that group identification is positively associated with health behaviour. Specifically, we will measure the number of social groups with which one identifies, and will then test the proposition that *one's behaviour becomes incrementally healthier as a function of one's number of group identifications.* In this respect, our methodology shares similarities with research examining the effects of multiple group memberships on wellbeing, (discussed above). However, there is also an important difference. Instead of simply asking a participant to list the groups of which he/she is a member (which assumes that group memberships are equivalent to group identifications), we explicitly assess whether he/she *identifies* with various groups. We deem this difference as important because, in our opinion, acknowledging membership of a group does not necessarily imply identifying with that group.

Previous research has revealed that the effects of group identification on mental health are stronger than, and largely independent from, the effects of frequency of interaction with in-group members on mental health (Sani et al., 2012). This is important because it confirms that in the context of mental health, the 'active ingredient' of group life – as aptly defined by Cruwys, Haslam, Dingle, Haslam, & Jetten (2014) - is subjective identification with the group, above and beyond mere intensity of contact. Therefore, a further aim of this paper is to assess how one's number of group identifications compares with one's number of contact-intensive groups in terms of their respective influences on health behaviours.

Method

Participants and Procedure

This study is based on the Scottish portion of the data obtained for Wave 1 of the two-wave Health in Groups project. Five General Practitioner (GP) surgeries situated throughout Scotland posted participation invitations to all their patients for whom the study was deemed suitable

(individuals over 18 years without learning difficulties, terminal illnesses, or conditions such as Alzheimer's disease, dementia or schizophrenia). Interest in participating was expressed by returning a reply slip included with the invitation, and 2508 patients did so. These patients were sent a Wave 1 questionnaire, which was completed and returned by 1824 patients (henceforth *participants*; 771 males, 1053 females, M_{age} = 57.55 years, *SD* = 14.57, range: 18-97 years).

Questionnaire Measures

Group Identification

Although there are various instruments assessing group/social identification, we felt the need to create a novel one (referred to as the *Group Identification Scale* (GIS) for the purposes of our project). We wanted a manageable, easy-to-understand instrument based on items that would adequately reflect the *phenomenology* of group identification (i.e., how people ordinarily and spontaneously describe their identification). This led us to produce a four-item instrument, with each item anchored on a 1 ('I strongly disagree') to 7 ('I strongly agree') scale. The measure taps into two key experiential elements of group identification: a sense of belonging to the group and a sense of commonality with other group members. The items are: "I feel a bond with my [group]", "I feel similar to the other members of my [group]", "I have a sense of belonging to my [group]", and "I have a lot in common with the members of my [group]". As well as being theoretically derived, these items were also inspired by the results of a relatively large survey in which members of Canadian communities were asked to explain what 'community identity' meant to them (Born, 2010). Most people spontaneously referred either to a sense of belonging/connectedness or to a sense of commonality/similarity, or to a combination of both.

Scale validation. We validated the GIS in three studies. The first (N = 331, M_{age} = 29.21 years) was conducted online, and confirmed that the scale – with specific reference to the family group - had good reliability (α = .92). Additionally, factor analysis revealed a clear single-factor structure

(Eigenvalue = 3.23), with 80.67% of the variance explained, and factor loadings ranging between .88 and .92. In the second study (N = 247, M_{age} = 29.65 years), also conducted online, participants rated their agreement with the items with reference to both their family group and a group of friends. The scale had good internal consistency (family: α = .91; friends: α = .90), and factor analysis confirmed a clear single-factor structure for both the family scale (Eigenvalue = 3.18; 79.57% of the variance explained; factor loadings ranging between .86 and .93), and the friends scale (Eigenvalue = 3.08; 77.05% of the variance explained; factor loadings ranging between .86 and .89). The scale also had convergent validity, as it correlated strongly with Doosje, Ellemers, and Spears' (1995) four-item group identification measure (family: r = .92, p < .01; friends: r = .87, p < .01) and with Postmes et al.'s (2013) single-item group identification measure (family: r = .87, p < .01; friends: r = .86, p < .001). Concerning divergent validity, our scale correlated significantly (but moderately) with Postmes' (2003) perceived group distinctiveness scale (a scale shown to be related to - but independent from - group identification; family: r = .28, p < .01; friends: r =.40, p < .01). In the third study, which involved university students completing a paper-and-pencil questionnaire (N = 57, M_{age} = 21.11 years), we confirmed that the scale - with specific reference to the family group - has good temporal stability (r = .91, p < .01, in a test-retest with an average 18-day time-lag between tests).

Main study. In our main study, participants completed the GIS with reference to their family (α = .92), local community (α = .94), and a group of their own choice (α = .93). Participants were instructed to define 'family' "in any way you wish (e.g., immediate family or extended family, etc.)", and 'local community' as "your neighbourhood, village, city area, or any other way you may define it". The chosen group was selected from a list including social groups such as sports team, group of friends, hobby group, etc.

We then created three binary variables, one for each group identification measure (i.e., family, local community, and chosen group). We did this by calculating each participant's average identification score for each of the three groups. If a participant's average score was below 5 for a

particular group, they received '0' for that binary variable (indicating no identification), while if their average score was 5 or more they received '1' for that binary variable (indicating identification). We then summed the three binary variables to create a variable indicating each participant's number of *group identifications*. This variable ranges from 0 (indicating the participant did not identify with any of the three groups) to 3 (indicating the participant identified with all three groups).

Group Contact

For each of the three social groups (family, local community, and chosen group), we asked three questions assessing the extent to which participants interacted with other in-group members and participated in group-related activities. The first two questions were identical for all three groups: "On average, with how many different members of your [group] do you have a face-to-face conversation in a single week?" and "On average, with how many different members of your [group] do you have a telephone/Internet conversation in a single week?" The third question differed depending on group-type. Concerning the family, we asked: "On average, how many family-related events (for instance meals out, parties, gatherings, trips, etc.) do you attend in a single month?" Concerning the local community, we asked: "On average, how many local community-related events (for instance parties, gatherings, trips, fundraising events, etc.) do you attend in a single year?" Concerning the chosen group, we asked: On average, how many events related to your chosen group (for instance parties, gatherings, trips, etc.) do you attend in a single year?"

We then created three binary variables (family contact, local community contact, and chosen group contact), each indicating whether the respondent did or did not have intensive contact with members of each specific in-group. For each variable this involved two steps. First, we transformed each participant's responses to the three contact questions into *Z*-scores, and summed these three Z-scores into an overall measure of contact. Second, if a participant scored below 0 on the overall measure of contact, they received '0' for the relevant binary variable (no intensive contact), while if

they scored 0 or more they received '1' for the relevant binary variable (intensive contact). Finally, we summed these three binary variables to create a variable indicating one's number of *contact-intensive groups*. This variable ranges from 0 (indicating the participant did not have intensive contact with any of the three groups) to 3 (indicating the participant had intensive contact with all three groups).

For details of how we handled missing data, see Appendix 1 in the supplementary material.

Health Behaviours

We measured self-reported *health behaviours* with four items. Specifically, participants indicated how many i) units of *alcohol* they consume in an average week (assuming that one unit of alcohol = "a small glass of wine OR a pub measure of spirits OR a half pint of beer"), ii) *cigarettes/cigars/pipes* they smoke in an average day, iii) days in an average week they engage in "any type of *physical activity* carried out to improve fitness, e.g. swimming, walking", and iv) portions of *fruit and vegetables* they consume in an average day (assuming that a portion of fruit/vegetables = "one medium-sized fruit like an apple OR two small fruits like plums OR one or two handfuls of berries/grapes OR three tablespoons of vegetables like peas").

We then created four binary variables (one for each health measure). Regarding alcohol, the variable indicated whether or not participants drink heavily, based on National Health Service guidelines (0 = non-heavy drinker - i.e., female consuming 21 units or less per week/male consuming 28 units or less per week; 1 = heavy drinker - i.e., female consuming 22 units or more per week/male consuming 29 units or more per week). Regarding smoking, the variable indicated whether or not participants smoke (0 = no cigarettes/cigars/pipes smoked per day; 1 = at least 1 cigarette/cigar/pipe smoked per day). Regarding exercise, the variable indicated whether or not participants engage in any form of exercise (0 = participant exercises on 0 days per week; 1 = participant exercises on at least 1 day per week). Regarding fruit/vegetables, the variable indicated whether or not participants

have a healthy diet (0 = participant consumes less than 3 portions of fruit/vegetables per day; 1 = participant consumes 3 or more portions of fruit/vegetables per day).

Demographic variables

As well as recording *gender* and *age*, we also asked participants to indicate the highest level of *education* they had obtained. We created a binary variable where participants with up to high school education scored 0 and participants with any qualification above high school education scored 1. We also created a binary variable to indicate if the participant was in a *relationship* at the time of questionnaire completion (marriage, civil partnership or informal partnership); 0 = no, 1 = yes.

Results

Cross Tabular Analyses

We present three tables of cross-tabular analyses. These provide a thorough description of the data, both in terms of frequencies and the degree of association between the variables.

We began by investigating the health behaviour frequencies (exercise, healthy diet, smoking, and heavy drinking) as a function of number of group identifications. Table 1 reports these frequencies, together with the chi-square value (and statistical significance) for each of the four health behaviours. This analysis shows that as the number of identifications increased, the proportion of participants behaving healthily also increased, with the relationship following a clear gradient. For instance, concerning smoking, 24.20% of respondents without any group identification were smokers, compared to 13.10%, 9.40% and 7.10% for respondents with one, two, and three group identifications respectively. The associations between number of group identifications and exercise, $\chi^2\,(3) = 49.83$, $p < .01$, healthy diet, $\chi^2\,(3) = 43.33$, $p < .01$, and smoking, $\chi^2\,(3) = 31.98$, were all significant. The association between number of group identifications and heavy drinking, $\chi^2\,(3) = 31.98$, $p = .05$, was marginally significant. It should be noted that changes in health behaviours appeared greater when moving from 0 to 1 group identification than when moving either from 1 to 2

or 2 to 3 group identifications. Post-hoc analyses exploring this issue are presented in Appendix 2 in the supplementary material.

(TABLE 1)

We then looked at the health behaviour frequencies as a function of the number of contact-intensive groups. The chi-square value (and statistical significance) for each health behaviour are reported in Table 2. We found that as the number of contact-intensive groups increased, so did the proportion of participants engaging in exercise, $\chi^2(3) = 22.62$, $p < .01$, and having a healthy diet, $\chi^2(3) = 24.00$, $p < .01$. However, no statistically significant links emerged regarding smoking or heavy drinking.

(TABLE 2)

Finally, we explored the health behaviour frequencies as a function of level of education, relationship status, and gender. The chi-square value (and statistical significance) for each health behaviour are reported in Table 3. Participants with education above high school were more likely to exercise, $\chi^2(1) = 10.68$, $p < .01$, have a healthy diet, $\chi^2(1) = 29.90$, $p < .01$, and not to smoke, $\chi^2(1) = 20.90$, $p < .01$, than participants with education up to high school. Similarly, participants in a relationship were more likely to exercise, $\chi^2(1) = 4.80$, $p < .05$, have a healthy diet, $\chi^2(1) = 16.98$, $p < .01$, and not to smoke, $\chi^2(1) = 20.87$, $p < .01$, than participants not in a relationship. Concerning gender, women were more likely to have a better diet, $\chi^2(1) = 18.72$, $p < .01$, and were less likely to drink heavily, $\chi^2(1) = 44.18$, $p < .01$.

(TABLE 3)

Point-biserial Correlations

To investigate the association between age and the different types of health behaviours, we conducted four point-biserial correlations. We found age to be negatively associated with smoking ($r_{pb} = -.11$, $p < .01$) and positively associated with healthy diet ($r_{pb} = .06$, $p < .01$). There was no

correlation either between age and exercising (r_{pb} = -.01, p = .71) or between age and heavy drinking (r_{pb} = -.01, p = .71).

Logistic Regression Analyses

We then performed four direct binary logistic regressions in order to investigate the effects of six predictors - group identifications, contact-intensive groups, level of education, relationship status, age, and gender – on exercise, healthy diet, smoking, and heavy drinking respectively.

Assumptions

We began by checking whether the data met the assumptions required for logistic regression. First, we assessed the linearity of the logit for our continuous predictors (i.e., group identifications, contact-intensive groups, and age). This involved running each of the four logistic regressions with three additional interaction terms in each analysis (i.e., the interaction between each continuous variable and its own log). Only one of these interaction terms was statistically significant in one analysis: that for age when Smoker was being predicted. However, we re-ran the Smoker logistic regression analysis (see below) without the age variable, and doing this did not change the pattern of results. We then tested the data for multicollinearity. Tolerance values ranged from .78 to .96, while the highest Variance Inflation Factor value was 1.28, clearly indicating a lack of multicollinearity. Finally, we investigated outliers: the number of cases with a studentized residual value above 2 never reached a number that could cause concern. On the basis of these results, we proceeded with the analyses.

Analyses

The first logistic regression (see Table 4) focussed on the impact of the predictors on the odds that participants would report that they exercise at least once a week. Number of group identifications was the strongest predictor of exercising, with every additional group identification increasing the odds of exercising, OR = 1.49. Two other predictors made a unique statistically

significant contribution to the model: level of education, with participants with an education above high school having greater odds to exercise than participants with up to a high school education, OR = 1.41, and number of contact-intensive groups, with every additional contact-intensive group increasing the odds of exercising, OR = 1.22.

(TABLE 4)

The second logistic regression looked at the impact of the six predictors on the healthy diet variable (the likelihood that participants would report eating at least three portions of fruit and vegetables per day; see Table 5). The strongest predictor of healthy diet was level of education, with participants with an education above high school having greater odds to adopt a healthy diet than participants with up to a high school education, OR= 1.85. Concerning the impact of group identifications on healthy diet, results showed that a greater number of group identifications predicted greater odds of having a healthy diet, OR = 1.21. A greater number of contact-intensive groups also predicted greater odds of having a healthy diet, OR = 1.18, as did being in a relationship, OR = 1.67, being older, OR = 1.02, and being female, OR = 0.62.

(TABLE 5)

The third logistic regression looked at the impact of the six predictors on the likelihood that participants would report they smoke at least once per day (see Table 6). Four predictors were found to have statistically significant unique effects on smoking: group identifications, education, relationship status, and age (although this latter result should be treated with caution because of the non-linearity of its logit). Older people, those with an education above high school, and those in a relationship were less likely to smoke, ORs = 0.97, 0.46, and 0.50 respectively. Greater number of group identification also predicted lower odds of smoking, OR=.77.

(TABLE 6)

The final logistic regression concerned the effects of our six predictors on the likelihood that participants would report drinking heavily (≥ 22 units per week if female, or ≥ 29 units per week if male; see Table 7). Three predictors had statistically significant unique effects on heavy drinking: group identifications, contact-intensive groups, and gender. Of these, gender was the strongest predictor, with males having much greater odds of being heavy drinkers than women, OR= 6.64. Concerning group identifications, a greater number of these predicted lower odds to be a heavy drinker, OR= 0.66. As far as contact-intensive groups was concerned, we found that for any additional contact-intensive group, participants' odds of drinking heavily increased, OR = 1.57.

(TABLE 7)

Discussion

Overall, findings from this large cross-sectional study confirm our prediction. Group identification - i.e. one's own sense of belonging to a group, coupled with a sense of communality with in-group members – is linked to health behaviours. Specifically, with reference to three social groups (family, local community, and a group chosen by the participant), the greater the number of groups with which one identifies, the lower the odds that one smokes and drinks heavily, and the greater the odds that one exercises and eats healthily. These effects were found to be statistically significant even after taking into account the number of groups with which one has intensive contact, relationship status, level of education, gender, and age.

Importantly, although some health behaviours may have been affected more strongly by one of the covariates than by the number of group identifications (e.g., education was the strongest predictor of healthy diet, and gender was the strongest predictor of heavy drinking), number of group identifications was the only predictor that exerted statistically significant effects on *all* four of the health behaviours considered. Furthermore, one's number of contact-intensive groups was a much weaker predictor of health behaviours than one's number of group identifications. While it succeeded

in predicting healthy diet and exercise, a greater number of contact-intensive groups failed to predict smoking, and even predicted greater inclination to drink heavily.

These findings might justify a reconsideration of results obtained from social epidemiological and sociological research showing that social ties - operationalised mainly in terms of amount of contact with groups and networks - lead to more positive health behaviours. For example, data stemming from a large prospective study of Californians revealed that greater overall involvement with formal (e.g., religious organizations) and informal (e.g., friends and relatives) social networks was associated with healthier behaviour over a 10-year period (Berkman & Breslow, 1983). Consistent with these results, Musick and Wilson (2007) found an association between greater participation in community activities and healthier lifestyles in a sample of adults. We suspect that these results were due, at least partially, to the effects of identification with the groups investigated.

Arguably, the main reason for the positive impact of group identifications on health behaviour is that, in many cases, groups prescribe healthy behavioural norms, and people who identify strongly with these groups will have a strong tendency to comply with such norms. However, we do not think this is the whole story. Specifically, we believe that in many cases, identification with a social group will (i) enhance one's sense of meaning and purpose in life, thereby leading to higher levels of self-care, and (ii) increase one's sense of responsibility toward other in-group members, thereby leading to greater motivation to be healthy in order to fulfil those responsibilities. Taken together, these processes amply overcompensate for the fact that some groups may prescribe unhealthy norms.

However, because our study is cross-sectional study, our speculations about possible causal links between group identifications and health behaviour must be made with caution. Although, theoretically, it seems plausible to consider identification with groups as the cause and health behaviour as the effect, the possibility of reversed causation cannot be ruled out. For instance, living a very unhealthy life might lead to greater social isolation, thereby reducing opportunities for group identification. Furthermore, we cannot discard the possibility that the relationship between group

identifications and health behaviour is spurious. For instance, it might be that these two variables are correlated outcomes of another factor, such as level of education. A longitudinal analysis is therefore necessary, and Wave 2 of our Health in Groups project should shed light on this important issue.

To conclude, our results confirm that groups are not only a context for social interaction, but are often objects of intense psychological investment and identification. In addition, our results reveal that the more groups we identify with, the healthier our behaviour. This, we believe, constitutes a step forward in our understanding of one of the most important facts about human existence, namely the deep, inextricable connection between sociality and health.

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Table 1. Frequencies and percentages for the health behaviour variables at each level of Group Identifications (0-3), including chi-square values

	Exercise		Healthy Diet		Smoker		Heavy Drinker	
No. of Group Identifications	No	Yes	No	Yes	No	Yes	No	Yes
0	26	64	41	50	69	22	83	7
(*n* = 93)	28.90%	71.70%	45.10%	54.90%	75.80%	24.20%	92.20%	7.80%
1	53	258	92	220	272	41	296	14
(*n* = 316)	17.00%	83.00%	29.50%	70.50%	86.90%	13.10%	95.50%	4.50%
2	66	512	133	448	528	55	558	24
(*n* = 585)	11.40%	88.60%	22.90%	77.10%	90.60%	9.40%	95.90%	4.10%
3	59	743	144	653	747	57	781	21
(*n* = 806)	7.40%	92.60%	18.10%	81.90%	92.90%	7.10%	97.40%	2.60%
	χ^2 (3) = 49.83; *p*<.01		χ^2 (3) = 43.33; *p*<.01		χ^2 (3) = 31.98; *p*<.01		χ^2 (3) = 7.01;*p*=.05	

Note. 24 participants had a missing value for No. of Group Identifications. They are excluded from this table. Missing values prevent frequencies in the table always summing to match the overall *N*s in the first column.

Table 2. Frequencies and percentages for the health behaviour variables at each level of Contact-intensive Groups (0-3), including chi-square values

	Exercise		Healthy Diet		Smoker		Heavy Drinker	
No. of Contact-intensive Groups	No	Yes	No	Yes	No	Yes	No	Yes
0	97	537	183	454	565	74	616	18
(*n* = 642)	15.30%	84.70%	28.70%	71.30%	88.40%	11.60%	97.20%	2.80%
1	60	481	120	419	491	54	525	17
(*n* = 545)	11.10%	88.90%	22.30%	77.70%	90.10%	9.90%	96.90%	3.10%
2	26	316	61	279	312	30	323	19
(*n* = 343)	7.60%	92.40%	17.90%	82.10%	91.20%	8.80%	94.40%	5.60%
3	8	166	25	148	162	11	166	7
(*n* = 174)	4.60%	95.40%	14.50%	85.50%	93.60%	6.40%	96.00%	4.00%
	χ^2 (3) = 22.62; *p*<.01		χ^2 (3) = 24.00; *p*<.01		χ^2 (3) = 4.92; *ns*		χ^2 (3) = 5.25; *ns*	

Note. 120 participants had a missing value for Number of Contact-intensive Groups. These are excluded from the relevant sections of this table. Missing values prevent frequencies in the table always summing to match the overall *N*s in the first column.

Table 3. Frequencies and percentages for the health behaviour variables at each level of each of the control variables, including chi-square values

		Exercise		Healthy Diet		Smoker		Heavy drinker	
		No	Yes	No	Yes	No	Yes	No	Yes
Education	Up to high school	98	549	197	454	562	91	625	24
	(*n* = 659)	15.10%	84.90%	30.30%	69.70%	86.10%	13.90%	96.30%	3.70%
	Above high school	114	1031	216	924	1066	84	1104	42
	(*n* = 1152)	10.00%	90.00%	18.90%	81.10%	92.70%	7.30%	96.30%	3.70%
		χ^2 (1) = 10.68; *p*<.01		χ^2 (1) = 29.90; *p*<.01		χ^2 (1) = 20.90; *p*<.01		χ^2 (1) = 0.00; *ns*	
Relationship	No relationship	64	371	133	305	375	68	414	21
	(*n* = 449)	14.70%	85.30%	30.40%	69.60%	84.70%	15.30%	95.20%	4.80%
	Relationship	147	1211	282	1073	1253	108	1316	45
	(*n* = 1364)	10.80%	89.20%	20.80%	79.20%	92.10%	7.90%	96.70%	3.30%
		χ^2 (1) = 4.80; *p*<.05		χ^2 (1) = 16.98; *p*<.01		χ^2 (1) = 20.87; *p*<.01		χ^2 (1) = 2.16; *ns*	
Gender	Female	120	920	202	838	958	91	1032	12
	(*n* = 1053)	11.50%	88.50%	19.40%	80.60%	91.30%	8.70%	98.90%	1.10%
	Male	92	669	214	547	678	86	707	54
	(*n* = 771)	12.10%	87.90%	28.10%	71.90%	88.70%	11.30%	92.90%	7.10%
		χ^2 (1) = 0.13; *ns*		χ^2 (1) = 18.72; *p*<.01		χ^2 (1) = 3.34; *ns*		χ^2 (1) = 44.18; *p*<.01	

Note. 13 participants had a missing value for Education, and 11 participants had a missing value for Relationship. These cases are excluded from the relevant sections of this table. Missing values prevent frequencies in the table always summing to match the overall *N*s in the first column.

Table 4. Summary of logistic regression analysis for variables predicting Exercise

Variable	B	SE	Wald statistic	*p*	Odds ratio	95% CI for Odds Ratio	
						Lower	Upper
Group Identifications (0-3)	.40	.09	18.77**	<.001	1.49	1.25	1.79
Education (0/1)	.35	.16	4.50*	.03	1.41	1.03	1.94
Relationship (0/1)	.19	.18	1.10	.29	1.20	0.85	1.70
Age (years)	-.002	.01	0.18	.67	1.00	0.99	1.01
Gender (0/1)	.04	.16	0.05	.83	1.04	0.75	1.43
Contact-intensive Groups (0-3)	.20	.10	4.28*	.04	1.22	1.01	1.48

* $p < .05$; ** $p < .01$.

Table 5. Summary of logistic regression analysis for variables predicting Healthy Diet

Variable	B	SE	Wald statistic	*p*	Odds ratio	95% CI for Odds Ratio	
						Lower	Upper
Group Identifications (0-3)	.19	.07	7.01**	.008	1.21	1.05	1.40
Education (0/1)	.61	.13	23.98**	<.001	1.85	1.44	2.36
Relationship (0/1)	.52	.14	14.42**	<.001	1.67	1.28	2.18
Age (years)	.02	.004	16.57**	<.001	1.02	1.01	1.03
Gender (0/1)	-.49	.12	15.52**	<.001	0.62	0.48	0.78
Contact-intensive Groups (0-3)	.16	.07	5.27*	.02	1.18	1.02	1.35

* $p < .05$; ** $p < .01$.

Table 6. Summary of logistic regression analysis for variables predicting Smoker

Variable	B	SE	Wald statistic	*p*	Odds ratio	95% CI for Odds Ratio	
						Lower	Upper
Group Identifications (0-3)	-.27	.10	6.96**	.008	0.77	0.63	0.93
Education (0/1)	-.78	.17	20.10**	<.001	0.46	0.33	0.64
Relationship (0/1)	-.69	.18	14.75**	<.001	0.50	0.35	0.71
Age (years)	-.03	.01	28.56**	<.001	0.97	0.96	0.98
Gender (0/1)	.30	.17	2.92†	.09	1.34	0.96	1.89
Contact-intensive Groups (0-3)	.01	.10	0.01	.91	1.01	0.83	1.23

† $p < 1.0$; ** $p < .01$.

Table 7. Summary of logistic regression analysis for variables predicting Heavy Drinker

Variable	B	SE	Wald statistic	*p*	Odds ratio	95% CI for Odds Ratio	
						Lower	Upper
Group Identifications (0-3)	-.41	.16	6.84**	.009	0.66	0.48	0.90
Education (0/1)	.02	.28	.01	.94	0.98	0.56	1.71
Relationship (0/1)	-.37	.31	1.46	.23	0.69	0.38	1.26
Age (years)	-.01	.01	1.43	.23	0.99	0.97	1.01
Gender (0/1)	1.89	.34	30.31**	<.001	6.64	3.38	13.03
Contact-intensive Groups (0-3)	.45	.15	9.03**	.003	1.57	1.17	2.10

** $p < .01$.