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ORIGINAL PAPER

The joy of pain and the pain of joy: In-group identification predicts schadenfreude and gluckschmerz following rival groups' fortunes

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Abstract Four studies examined how in-group identification in the domain of sports is associated with schadenfreude in reaction to another group's suffering or gluckschmerz in reaction to another group's good fortune. Schadenfreude increased as a function of in-group identification when the outgroup was a rival team rather than a non-rival team in Study 1. Study 2 showed that those who experience schadenfreude at learning of an outgroup player's injury will also tend to feel gluckschmerz when they learn of the player's recovery. Studies 3 and 4 replicated and extended these findings for both schadenfreude and gluckschmerz, and showed that neither the degree of severity of an injury nor the level of physical pain associated with the injury moderated the link between identification and both schadenfreude and gluckschmerz. Mediation analyses indicated that perceived in-group gain or loss, deservedness, and dislike were prime mediators of links between in-group identification and both emotions.

Keywords Schadenfreude · Emotion · Gluckschmerz · Identity · Intergroup relations · Pain

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Introduction

The historian, Peter Gay, spent his early years as a Jew in the Nazi-subjugated Berlin of the 1930's, where he and his family suffered many barbaric persecutions until they managed to escape in the spring of 1939 (Gay 1998). He also developed many survival strategies, but perhaps the most effective one was to immerse himself into sports. He readily identified with individual players and teams, and he followed their ups and downs with intensity. He was happy when his heroes and his teams did well and depressed when they did poorly—and, either way, this focus seemed to blunt the effects of the ever more pitiless actions of the Nazi thugs (Portmann 2000; Smith 2013).

Gay's emotions ran the full gamut, and some of his more satisfying feelings involved schadenfreude (pleasure at another person's misfortune). By the 1936 Berlin Olympics, the world event that the Nazis used to showcase Aryan superiority, Gay and his father supported "the Americans passionately" (Gay 1998, p. 70). They attended most of the events, and the one that stood our most in

Gay's memory was the women's 4 × 100 meter relay, in which the highly favored German team failed. The schadenfreude this created in Gay was one of the "greatest joys" in his life (Gay 1998, p. 83).

Gay's experience of the Olympics included not only schadenfreude when German athletes failed but also gluckschmerz (displeasure in another person's good fortune), when they succeeded. As he summarized his feelings, "Unfortunately, many German athletes also did well enough to win an array of gold medals. I took them all as virtually personal insults" (Gay 1998, p. 81). Both his schadenfreude and gluckschmerz were keenly felt and freshly told in his memoirs.

Gay's account is striking in that it highlights experiences of two emotions that are ordinarily suppressed rather than proclaimed (Cikara et al. 2011b; Smith et al. 2009). The normative response to the suffering of others is sympathy not pleasure (Smith et al. 1996; Smith 2013; Van Dijk and Ouwerkerk 2014), and the normative response to their success is to be happy rather than displeased (Cikara et al. 2011a; Smith et al. 2006). What was it about these situations that promoted schadenfreude and gluckschmerz instead?

Deservedness

Deservedness was one apparent explanation. The Nazi regime had committed so many wrongs and had promulgated so many lies about Aryan superiority that any negative event which caused the Nazi's embarrassment and opposed their lies was well deserved—and pleasing as a result. Similarly, any event that *furthered* the Nazi's goals and furthered these lies violated Gay's sense of justice—and so was displeasing. Although there is no empirical work on gluckschmerz and deservedness, a number of studies confirm that deserved misfortunes are likely to produce schadenfreude in observers as well. People seen as responsible for their misfortunes, for example, are also seen as deserving their misfortunes, which then leads to schadenfreude in observers (e.g., Feather 2006; Van Dijk et al. 2005, 2008). Also, perceiving another's initial success as undeserved increases schadenfreude in reaction to a subsequent failure (e.g., Feather and Sherman 2002).

Dislike

Another explanation for Gay's schadenfreude and gluckschmerz was his loathing of the Nazis. Naturally, being persecuted by others can lead to disliking them intensely and probably to schadenfreude if they happen to fail and gluckschmerz if they prosper. Empirical work confirms this common sense prediction in the case of schadenfreude (e.g., Hareli and Weiner 2002; Van Dijk et al. 2005, 2006, 2011), though one study suggests that anger toward an outgroup due to perceived in-group inferiority (*ressentiment*) is a better predictor than dislike and dislike-based anger (Leach and Spears 2008). As with deservedness, there is no empirical work offering confirmation of a link between dislike and gluckschmerz.

Identification and in-group gain

Yet another likely explanation for Gay's schadenfreude involved the degree to which he identified with certain groups. Not only did he identify with America, he felt a *negative* identity with his native Germany, which was now a hated rival. The 1936 Olympics was an event that he "breathlessly anticipated and just as breathlessly enjoyed" (p. 78), and the joys came from *German* defeats and *American* victories. The defeat of the German women's relay team was so sweet in part because it combined a German defeat with an American victory. Consistent with social identity theory (e.g., Oakes and Turner 1980; Ouwerkerk and van Dijk 2014), the uplift in feelings presumably based in part from an enhanced social identity was palpable (e.g., Gaertner and Insko 2000; Hornsey 2008), and indeed Leach and Spears (2009) found that schadenfreude toward an outgroup is associated with improved in-group evaluations in the context of a prior loss to the outgroup.

Research by Combs et al. (2009) on political affiliation and schadenfreude provides some empirical evidence consistent with Gay's experience. Degree of identification with either the Democratic or Republican Party predicted greater schadenfreude in response to events having unfortunate consequences for the opposing party. This research focused on identification with a political party, but there is likely to be much similarity to how we identify with sports teams—and, indeed, Gay's experience blended sports with the political. Leach et al. (2003) found that domain interest in soccer positively predicted Dutch soccer fan's reactions to the German team's loss in the World Cup soccer tournament (notably, the Germans' loss had no bearing on the Dutch team's fortunes), especially when the Dutch team's historic weakness had not been made salient. A measure of team identification was unrelated to schadenfreude, but as the authors noted, highly identified fans may have been under chronic domain inferiority threat whether they had been reminded of this inferiority or not (Leach et al. 2003).

Cikara et al. (2011b) used both self-report and fMRI methods to examine the reactions of hardcore fans of archrival Major League Baseball teams the Boston Red Sox and the New York Yankees as they watched simulated successes (e.g., home runs) and failures (e.g., strike outs) by their own team, the rival team, or a team that was not a strong rival at the time (the Baltimore Orioles). Participants had relatively muted emotional reactions to "control" plays in which two non-rival teams (the Orioles and the

Toronto Blue Jays) faced off against one another. However, they reported substantial pain and anger in reaction to the rival team's success, and pleasure in reaction to the non-rival team's failure, at the hands of both one's favored team or the Orioles. Also, neuroimaging results revealed activation of the ventral striatum (VS), a pleasure-related area of the brain, in reaction to the rival team's failure. Further, the anterior cingulate cortex (ACC) and the insula, which are activated in response to personal and observed pain, were activated by a rival team's success (Cikara et al. 2011b). These results suggested that fans do not indiscriminately experience joy and pain in reaction to another team's failures and successes; the other team's performance must have implications for their identity as a fan of the favored team.

Overview

This prior research supports the view that our social identity in the domain of sports can be a powerful basis for our emotional reactions to events. The present research aims to extend these findings in a number of ways.

How broadly does in-group identification predict schadenfreude and gluckschmerz?

The specific evidence for linking social identity in the domain of sports with schadenfreude is incomplete and its relation to gluckschmerz relatively unexplored (but see Cikara et al. 2011b). The research by Leach et al. (2003) found no support for linking schadenfreude with group identity; it was domain importance (i.e., interest in World Cup soccer) that moderated schadenfreude rather than group identity. As just noted, highly identified fans may have been under chronic domain inferiority threat whether they had been reminded of their inferiority or not. Also, group identity was assessed through questions assessing Dutch patriotism, rather than identification with the Dutch national soccer team per se, perhaps weakening the directness of the link between group identity and the rival's loss. Interestingly, in a related study, Leach and Spears (2008) found that domain interest in a fictitious, but ostensibly-real, inter-university quiz competition played a lesser role than the pain of domain inferiority in leading to schadenfreude in reaction to another team's downfall. Leach and colleagues' work therefore casts some doubt as to whether in-group identification plays more than a minor role in intergroup schadenfreude after accounting for other factors.

Cikara et al. (2011b) showed compelling effects for schadenfreude based on whether a rival or a non-rival team was making simulated bad plays. Participants were selected for the study based on an intense love for their own team as well as an intense hate of the rival team, together with an extensive knowledge of both teams. Thus, their sample excluded more casual fans, as well as those highly identified fans who did not strongly "hate" the rival team. Using such a selection process was important given the focus on brain activation and the necessity of presenting multiple stimuli in the scanner. One aim of the present research was to provide further evidence linking social identity based on sports allegiance to schadenfreude using a broader range of in-group identification and without combining identification with hostility—although we expected identification to relate to hostile feelings. In four studies, participants read about an event involving a rival who suffered in some way, and in some cases (Studies 2–4), was then shown to recover. Participants also completed a measure of group identification either some weeks before responding to the event(s), (Study 2) or just afterward (Study 1 and Studies 3–4). We expected the degree of participants' identification with their team would predict the amount of schadenfreude they would feel in response to the misfortune as well as the amount of gluckschmerz following recovery.

Addressing potential challenges to the validity of statistical inference

The present research involved participants along the full-spectrum of in-group identification rather than a subgroup of people very highly identified with their in-group, and investigated reactions to ostensibly-real events, rather than simulated or imagined events. Thus, the focal measures, such as schadenfreude, may have been particularly vulnerable to underreporting biases frequently encountered in related research (Smith and Kim 2007). Aside from schadenfreude in the outgroup-rival-loss condition of Study 1, reports of these emotions were quite low, resulting in zero-inflation and positive skew of dependent measures. A number of steps have been taken to bolster the inferential validity of statistical results. First, for all studies, we provide tables with both Pearson's r and Kendall's τ-b rank correlation coefficients; the latter is a robust non-parametric measure of association that accounts statistically for ties. Second, for regression and mediation analyses, to deal with heteroscedasticity, we used heteroscedasticity-consistent (HC) covariance matrices to estimate the standard errors of the regression coefficients (HC4m for regression analyses and HC3 for mediation analyses) and removed outlying observations based on statistical cut-offs discussed in the notes for the studies (Chand and Aftab 2012; Cribari-Neto and da Silva 2011). Fourth, we obtained a large sample for Study 3 ($N = 279$), enabling us to "two-part model" (Olsen and Schafer 2001) schadenfreude and gluckschmerz by first modeling the presence or absence of schadenfreude and gluckschmerz (i.e., whether $Y > 0$)

with logistic regression and then modeling the natural log of the intensity of schadenfreude and gluckschmerz, given their presence (i.e., the intensity of the emotion given $Y > 0$). These steps helped with zero-inflation, heteroscedasticity, and non-normality of residuals. In some studies, nonlinearity of the relationships between in-group identification, schadenfreude and gluckschmerz appeared likely upon inspection of scatterplots, and thus we tested for quadratic in-group identification effects in regression models to better specify the models. Together, these efforts should boost confidence in statistical inferences.

Will in-group identification predict schadenfreude and gluckschmerz in reaction to severe misfortunes or significant outgroup good fortunes?

A third issue concerns whether schadenfreude and gluckschmerz can follow from severe misfortunes, beyond a rival's loss or an unsuccessful play (Cikara et al. 2011b). Some scholars (Ben-Ze'ev 1992), argue that, with regard to schadenfreude, it occurs only with minor misfortunes. Yet Hareli and Weiner (2002), using remembered accounts and hypothetical scenarios, provide evidence that schadenfreude can occur in reaction to a moderately severe misfortune. Furthermore, at least in the domain of politics, highly identified participants went as far as to express a small degree of pleasure over troop deaths—if they helped their party win an election (Combs et al. 2009). No research has manipulated misfortune severity, and so in Studies 3 and 4 we varied the severity of an injury. In Studies 2–4, the injured player was shown to recover. Our aim was to assess whether group identification would be associated with both schadenfreude and gluckschmerz even in response to relatively severe events like injuries.

What mediational processes help explain the association of in-group identification with schadenfreude and gluckschmerz?

Although our main goals were to examine whether in-group identification predicts schadenfreude and gluckschmerz across a range of misfortunes or good fortunes, an additional, secondary aim of our research was to test mediational processes. In each of the studies, we also included items having face-valid links to other variables that previous research has shown to be related to schadenfreude in interpersonal or inter-group contexts, such as dislike of the person or group suffering the misfortune (e.g., Hareli and Weiner 2002; Van Dijk et al. 2006) and the perceived deservedness of the misfortune (e.g., Feather and Sherman 2002; Van Dijk et al. 2005). We also examined perceptions of in-group gain resulting from the other group's misfortune, a factor implicit in research by Combs et al. (2009). We assessed the degree to which any association between in-group identification and schadenfreude and gluckschmerz might also be linked with these other factors. We expected in-group gain to show the strongest, most consistent link. The rival's loss should affect perceptions of in-group superiority and thus allow in-group members to bask in reflected glory (Cialdini et al. 1976). Moreover, such losses grant opportunities for esteem-enhancing downward social comparisons (Wills 1981). A rival's recovery obviates opportunities for basking in reflected glory and should result in a sense that the recovery hurts one's in-group, as it helps the rival outgroup.

Study 1

The aim of our first study was three-fold. First, we wanted to assess the association of in-group identification with schadenfreude across the range of identification levels from high to low. Second, we wanted to show that the association of in-group identification with schadenfreude was dependent on the outgroup suffering a misfortune being a rival rather than a non-rival. A third aim was to test for the mediational roles of dislike, deservedness, and in-group gain in explaining any predictive effects for in-group identification on schadenfreude.

Undergraduate participants learned of a loss to either a long-standing outgroup rival or a non-rival team and also completed a measure of in-group identification. We hypothesized that increased in-group identification would be associated with greater schadenfreude at learning of the loss of another team but only when it was a rival (Cikara et al. 2011b; Ouwerkerk and van Dijk 2014). Thus, highly identified fans were expected to have primarily socially appropriate reactions to the loss of a non-rival team (i.e., neutral feelings or a small amount of sympathy for the defeated team), while their emotional reactions were expected to be markedly different when they learned of a rival's loss. Feeling pleasure about learning of the rival's loss should instead be their dominant reaction, although they may still be ambivalent enough about the loss to experience some sympathy for the rival (Combs et al. 2009). Schadenfreude and sympathy should correlate negatively, although they are not polar opposites and should be considered independent constructs involving different processes (Feather and Sherman 2002). Thus, schadenfreude and sympathy may well coexist, reflecting ambivalent feelings about the outgroup's misfortune and the resulting consequences. We also expected that the association between in-group identification and schadenfreude over the rival team's loss would be related to perceptions that the loss would affect the fortunes of one's own team,

the perceived deservedness of the loss (e.g., Feather and Sherman 2002; Van Dijk et al. 2005, 2008), and disliking toward the rival team (Hareli and Weiner 2002; Van Dijk et al. 2006, 2011).

Method

Participants

Thirty-nine students at the University of Kentucky participated in Study 1. After removing outlying observations,[1] 34 participants' data remained for analysis. Students were recruited from the university's student union and dining halls. We did not record gender. However, there was an approximately equal number of male and female participants. Aside from a general tendency for males to report more schadenfreude than females, prior research has not revealed any other systematic effects for gender (e.g., Combs et al. 2009).

Materials

News articles Two articles describing recent events were copied from internet sources such that they preserved the look of the actual article, though they were edited for length (approximately 100 words each). One article described the University of Oregon's men's basketball team losing badly to Arizona State University's Team. As neither of the teams were direct rivals of the University of Kentucky (both were members of a different conference in a distant part of the country and had no history of notable rivalry), the result of the contest was expected to have had little impact on the University of Kentucky's team's fortunes. Thus, reactions to each team were unlikely to produce liking or dislike, nor any biased perceptions of deservedness of the outcome. Another article described an embarrassing, lopsided loss by Duke University's men's basketball team to Clemson University. Although Duke University and the University of Kentucky are in different conferences, they are close geographically and have been considered perennially strong rivals since 1992, when Kentucky lost a close tournament game in overtime to Duke on an improbable winning shot by a Duke player who, earlier in the game, had stepped on a Kentucky player's chest (Featherston 2012). Each team has won at least two national championships since this incident, and both are almost always in contention to win. Consequently, a loss by outgroup rival Duke should be perceived as a positive event for those highly identified with the University of Kentucky's men's basketball team and produce schadenfreude.

Measures

Schadenfreude and sympathy Three items, averaged together, assessed schadenfreude at Oregon or Duke's loss ($\alpha = .92$) ("A little pleased over the loss;" "Delighted over what happened;" and "I have to admit I smiled a bit."), and four items assessed sympathy ($\alpha = .86$) [e.g., "Sad for Oregon (Duke)" and "Sorry for Oregon (Duke)"]. These and the other dependent measures in each study were on an 8-point Likert scale (endpoints: 0 = "not at all;" 7 = "a whole lot"), unless otherwise indicated.

Correlates of schadenfreude

Perceptions of other team's loss helping Kentucky Three items ($\alpha = .78$) were included to measure reactions suggesting that Oregon or Duke's loss was pleasing because it might increase the fortunes of the University of Kentucky's men's basketball team (and thus enhance group identity): "Happy if it hurt Oregon (Duke);" "Hoped Oregon (Duke) would continue to lose;" and "Happy because it helps Kentucky."

Deservedness of the loss Two items ($\alpha = .94$) were included to measure perceptions of the deservedness of the loss: "Felt like Oregon (Duke) deserved it" and "Oregon (Duke) deserves these kinds of things."

Dislike Dislike for the outgroup was measured with a single item, "Dislike toward Oregon (Duke)."

Ashamed pleasure, unashamed pleasure, and gloating Single-item measures were included to assess ashamed and unashamed pleasure after reading about Oregon or Duke's loss: "Pleased but ashamed of feeling this way" and "Pleased and unashamed of it," respectively. These uncorrelated items ($\alpha = .01$) were included to allow an exploration of the degree to which participants experiencing schadenfreude considered those feelings to be (socially) acceptable or unacceptable. Finally, a two-item measure of gloating was included ($\alpha = .86$; "Felt like gloating" and "I gloated"), as reveling in the misfortune of another should logically be closely related to

[1] Outliers on schadenfreude and negative affect within the Oregon and Duke loss conditions were removed. Two participants scoring more than 1.5 times the interquartile range on schadenfreude in the Oregon condition were removed, while three participants more than 1.5 times the interquartile range on negative feelings over the Duke loss were removed. Including these observations eliminated the main effect of in-group identification on schadenfreude but the pattern of regression results was otherwise similar to those found for the data without outliers.

schadenfreude, given that both entail positive emotional reactions to the suffering of another.

In-group identification Wann and Branscombe's (1993) seven-item Sport Spectator Identification Scale (SSIS; $\alpha = .96$) was adapted to measure participants' identification with the University of Kentucky's men's basketball team, or in-group identification. Responses were on an eight-point Likert scale (0 = "not at all;" 7 = "a whole lot"). Sample items included "How important to YOU is it that the University of Kentucky basketball team wins?" and "How often do YOU display the University of Kentucky basketball team's name or insignia at your place of work, where you live, or on your clothing?"

General fandom Participants also completed the 5-item Sport Fandom Questionnaire (SFQ; $\alpha = .95$) to assess overall or general sport fandom (Wann et al. 1999) (E.g., "Being a sport fan is very important to me.") The measure was included as a covariate in analyses to ensure that identification with UK's basketball team predicts schadenfreude above and beyond general interest in sports.

Collective self-esteem A final scale, but of secondary interest, was the Collective Self-Esteem Scale (Luhtanen and Crocker 1992). In Studies 1 and 2, in which the scale was included, it was either weakly correlated or uncorrelated with schadenfreude, gluckschmerz, and sympathy.

Procedure

Participants were approached on the University of Kentucky campus, in settings such as the main library or student union, and asked if they would be willing to participate in a study about people's reactions to news stories. If they agreed to participate by signing a consent form, they were given an envelope containing the materials, were asked to complete them, and then seal them in the envelope. After delivering the cover story and instructions, the experimenter left the participant and sat alone reading while far enough away to give participants privacy in their responses. Participants read about the University of Oregon's loss to Arizona State University (non-rival team loss condition), or they read about Duke University's loss to Clemson University (rival team loss condition), randomly determined. Below the article on the same sheet of paper, participants completed the measures of sympathy, schadenfreude, and correlates of schadenfreude. They then completed the team and sports identification measures, which were attached on a second page. After completing the questionnaire packet, participants were told the full purpose of the study. No participants expressed suspicion over the focus of the study.

Results

Means and correlations

Table 1 contains a matrix of zero-order correlations and rank correlations among the dependent measures in this study, the condition independent variable, and the main predictor variable of in-group identification as well as sport fandom. In the Duke-loss condition ($n = 17$), controlling for sport fandom, in-group identification was strongly correlated with schadenfreude, $r = .73$, $p < .001$, $\tau = .54$, $p = .003$, whereas in-group identification was unrelated to schadenfreude in the Oregon-loss condition ($n = 17$), $r = -.13$, $p = .60$, $\tau = -.09$, $p = .62$.

In-group identification and schadenfreude

Multiple regression analyses were performed to test for the predicted interaction between condition and in-group identification; all continuous variables in these and subsequent multiple regression analyses with interaction terms were mean-centered (Aiken and West 1991). Condition, in-group identification, and the condition by SSIS interaction were entered simultaneously into the equation, along with general sport fandom. Additionally, the condition by fandom interaction was included in the model, per Yzerbyt et al.'s (2004) guidelines on interaction tests with covariates. The regression was performed on both untransformed schadenfreude (Y) and natural logarithm-transformed data due to positive skew in the outcome measure. Results were similar across models, except for a significant main effect of in-group identification that was present only in the regular OLS model and a significant main effect of fandom that was present only in the log OLS model (Table 2). Given the similarity of the results across these models, and the relative ease of interpretation of standard-OLS regression coefficients compared to those for log-transformed Y, the rest of the results of the regression and subsequent simple slopes analyses for Study 1 are based on the regression using untransformed data. There was a significant main effect of condition; those who read about the Duke loss reported more schadenfreude than those who read about Oregon's loss, $b = 2.95$, $SE_{\text{HC4m}} = 0.52$, $t = 5.71$, $p < .001$, and the predicted condition by SSIS interaction was significant, $b = 1.04$, $SE_{\text{HC4m}} = 0.32$, $t = 3.23$, $p = .003$; adding the squared SSIS term (i.e., quadratic in-group identification) did not improve model fit, $\Delta R^2 < .01$, $F_{\text{change}} = .25$, $p = .62$.

To probe the SSIS by condition interaction, regression equations with general fandom and the fandom × condition interaction as controls were computed at one standard deviation above and below the mean of SSIS, in addition to the equation already reported at average levels of SSIS

Table 1 Measures of association, Study 1, N = 34

	1	2	3	4	5	6	7	8	9	10	11
1 In-group identification	–	.634	.355	.232	.118	.253	.208	.189	.424	.025	−.115
p		**<.001**	**.006**	.082	.408	.064	.122	.16	**.001**	.844	.428
2 Sport fandom	.766	–	.387	.24	.115	.321	.278	.16	.346	.082	−.035
p	**<.001**		**.003**	.074	.42	**.019**	**.04**	.235	**.006**	.524	.809
3 Schadenfreude	.482	.431	–	.64	.377	.702	.771	.685	.742	−.079	.408
p	**.004**	**.011**		**<.001**	**.012**	**<.001**	**<.001**	**<.001**	**<.001**	.555	**.008**
4 Gloating	.256	.19	.749	–	.352	.772	.613	.733	.623	0	.252
p	.144	.282	**<.001**		**.024**	**<.001**	**<.001**	**<.001**	**<.001**	.999	.113
5 Pleased but ashamed	.171	−.049	.374	.032	–	.395	.408	.294	.351	.325	.131
p	.335	.783	**.029**	.858		**.013**	**.009**	.061	**.017**	**.028**	.443
6 Pleased and unashamed	.366	.375	.831	.861	.005	–	.732	.585	.636	−.126	.293
p	**.033**	**.029**	**<.001**	**<.001**	.979		**<.001**	**<.001**	**<.001**	.373	.072
7 Dislike of outgroup	.319	.346	.854	.768	.051	.844	–	.703	.667	−.155	.551
p	.066	**.045**	**<.001**	**<.001**	.776	**<.001**		**<.001**	**<.001**	.269	**.001**
8 Outgroup deservedness	.269	.156	.875	.848	.25	.778	.805	–	.603	−.112	.489
p	.124	.378	**<.001**	**<.001**	.154	**<.001**	**<.001**		**<.001**	.423	**.002**
9 In-group gain	.515	.408	.918	.809	.279	.828	.858	.871	–	−.058	.239
p	**.002**	**.017**	**<.001**	**<.001**	.11	**<.001**	**<.001**	**<.001**		.657	.113
10 Sympathy	.03	.107	−.208	−.093	.175	−.267	−.301	−.225	−.176	–	−.309
p	.868	.545	.239	.602	.323	.127	.083	.201	.32		**.042**
11 Condition[a]	−.164	−.053	.516	.328	.137	.371	.604	.531	.394	−.451	–
p	.354	.768	**.002**	.058	.44	**.031**	**<.001**	**.001**	**.021**	**.007**	
M	4.76	4.32	2.41	1.23	0.47	1.53	1.82	1.59	2.66	0.99	
SD	2.39	2.5	2.55	2.07	1.31	2.57	2.67	2.42	2.2	1.12	

Above diagonal: Kendall's τ-b rank correlation coefficients

Below diagonal: pearson correlation coefficients

Bold means $p < .05$

[a] 0 = non-rival oregon loss, 1 = rival duke loss

Table 2 OLS and LN(Y + 1) OLS models with HC4m SE estimates, Study 1

	Y	LN(Y + 1)
Intercept	1.12[a]	.59[a]
	[.57; 1.67]	[.33; .85]
In-group identification	.40[a]	.07
	[.08; .72]	[−.03; .18]
Sport fandom	.19	.13[a]
	[−.15; .53]	[.02; .24]
Condition (Oregon = 0, Duke = 1)	2.95[a]	.79[a]
	[1.94; 3.96]	[.44; 1.15]
Condition × in-group identification	1.04[a]	.31[a]
	[.41; 1.67]	[.10; .52]
Condition × sport fandom	−.26	−.09
	[−.94; .42]	[−.32; .13]
R^2	0.74	0.68
Adj. R^2	0.69	0.62
N	34	34

[a] 0 outside the 95 % CI

(Aiken and West 1991). Simple slopes indicated that, among low identified fans, there was no significant difference in schadenfreude experienced over rival Duke's loss as opposed to non-rival Oregon's loss, $b = 0.46$, $SE = 0.78$, $t = 0.59$, $p = .56$. As predicted, highly identified fans experienced much more schadenfreude after reading about Duke's than Oregon's loss, $b = 5.45$, $SE = 0.93$, $t = 5.84$, $p < .001$.

Perceived in-group gain, outgroup deservedness, and outgroup dislike were entered simultaneously as possible mediators of the in-group identification by condition interaction in a moderated mediation analysis with general fandom and the fandom × condition interaction as covariates and HC3 heteroscedasticity-consistent standard error estimates. These and subsequent mediation analyses were performed using the PROCESS SPSS macro for multiple mediation and moderation analyses (Hayes 2013). Significance tests of the indirect effects of in-group identification on schadenfreude via the potential mediators in the Oregon loss and Duke loss conditions are reported as bias corrected

95 % confidence intervals (CIs) (Efron 1987), based on 10,000 bootstrap samples. In the Oregon condition, in which little schadenfreude was expressed regardless of in-group identification, no significant mediation was observed. In the Duke loss condition, however, both gain, $b = 0.40$, $SE_{HC3} = 0.23$, 95 % CI (0.05, 1.03) and deservedness, $b = 0.32$, $SE_{HC3} = 0.20$, 95 % CI (0.04, .89) mediated in-group identification's effect on schadenfreude, whereas dislike of Duke was not a significant mediator, $b = 0.01$, $SE_{HC3} = 0.27$, 95 % CI (−.13, .78).

In single mediation analysis, perceptions of the outgroup's loss leading to in-group gain mediated the association between the condition by in-group identification interaction and schadenfreude when reacting to the rival outgroup's loss, $b = 0.68$, $SE_{HC3} = 0.25$, 95 % CI (0.32, 1.20). Perceived deservedness also had a conditional indirect effect in the Duke condition, $b = 0.61$, $SE_{HC3} = 0.30$, 95 % CI (0.28, 1.39), although dislike did not significantly mediate in-group identification's effects on reactions to the rival team's loss, $b = 0.33$, $SE_{HC3} = 0.42$, 95 % CI (−0.09, 1.42).

Discussion

Study 1 provided evidence that in-group identification is associated with schadenfreude in reaction to a rival team's loss. This finding held true even after controlling for general sport fandom, a related but distinct construct (Wann et al. 1999). Importantly, schadenfreude did not occur as an indiscriminate reaction to any other team's downfall; it only arose when the loss was suffered by a rival (Wann and Branscombe 1993). These findings replicate and extend prior findings showing that highly identified, hostile fans are likely to feel schadenfreude if their rival suffers a simulated failure (Cikara et al. 2011b) as well as findings that domain importance is associated with schadenfreude in the intergroup context of sports (Leach et al. 2003). Study 1 also extends the findings of Combs et al. (2009) that showed the role of in-group identification in schadenfreude over events that had implications for an outgroup's suffering and the in-group's gain. The present results link schadenfreude to an actual outgroup loss and provide further evidence that identification with sports teams is a realm where schadenfreude flourishes.

The in-group identification measure was positively related to perceptions of in-group gain, outgroup deservedness of the loss, and dislike. Whether entered individually or simultaneously in regression analyses, on the other hand, perceived gain and deservedness, but not dislike, mediated the interaction between in-group identification and condition. These results suggested that, among highly identified group members, perceptions of greater deservedness of a misfortune and in-group gain help explain why there is more schadenfreude in response to a rival group's than a nonrival group's misfortune, at least when it is a rather minor one like an embarrassing loss during the regular season, as opposed to a major one like a key player's injury. As discussed previously, however, less highly identified group members experienced little schadenfreude in response to outgroup misfortune whether the outgroup was a rival or not, presumably because the (relative) fortunes of the University of Kentucky's basketball team and rival Duke's basketball team were of little self-relevance to them (Mackie et al. 2000).

Study 2

We noted that there is another socially undesirable emotion, gluckschmerz, which is also likely to occur among people who identify highly with a sports team or group. With gluckschmerz, we are feeling disappointed or pained by another person or group's good fortune. One important goal of Study 2 was to examine this little-explored emotion. Already having completed in-group identification and general fandom measures during a mass testing session weeks earlier, participants read and reacted to two articles, the first describing the injury of an important rival player and the second describing the same player's unexpected recovery. We expected that gluckschmerz, like schadenfreude, would be predicted by group-identification; the more participants identified with their team, the more any good fortune happening to a rival would create gluckschmerz. We also expected to show that schadenfreude and gluckschmerz, though opposite in terms of their affective quality, are highly related; if we are predisposed to feel happy over a particular person or group's misfortune, then we are also predisposed to feel gluckschmerz if they experience good fortune instead.

Another goal of Study 2 was to examine whether in-group identification would be linked with schadenfreude over a clearly extreme misfortune. The outcome in Study 1 was the loss of an outgroup rival. Especially in the context of sports, showing pleasure in a rival's loss probably has little overlay of social undesirability. Indeed, most of the highly identified participants showed little shame over their pleasure. However, where will sports fans draw the line if misfortunes are more severe, such as an injury to a rival player? Even if highly identified fans might secretly feel happy over an injury (or, have mixed feelings), will few admit it? As noted earlier, some scholars claim that schadenfreude only ensues from mild misfortunes (e.g., Ben-Ze'ev 1992), but the recent evidence suggests otherwise (e.g., Combs et al. 2009; Hareli and Weiner 2002).

Expressing pleasure over another person's physical injury is plainly inappropriate. But would the perspective

of a highly identified fan alter this assumption? Research by Wann et al. (1999) would suggest so, as reported intentions to anonymously aggress against a player or coach on a rival team in order to help one's own team increase with strength of fan identification, controlling for general sport fandom. Subsequent research indicated that highly identified fans were more likely to express the intention to commit purely *hostile* acts of aggression anonymously, meaning that their team did not stand to benefit from the acts; notably, however, this intention declined with the severity of the misdeed (Wann et al. 2003).

The findings by Cikara et al. (2011b) also link schadenfreude with reactions to a rival team player's injury, as participants who physiologically evidenced schadenfreude during the baseball game simulation later indicated greater willingness to perpetrate aggressive acts against a rival team's fan than those experiencing less schadenfreude in response to rival team misfortunes. Self-reported schadenfreude non-significantly trended toward this willingness as well. Our aim was to test the implications of such prior research using participants' reactions to an actual severe misfortune and by measuring participants' levels of identification.

As in Study 1, we expected that in-group identification would be positively associated with schadenfreude. Moreover, we expected more gluckschmerz in response to the player's recovery among those higher in in-group identification than lower-identified fans. Indeed, we expected schadenfreude over the injury would set the stage for gluckschmerz over the recovery. In contrast, we expected lower fan identification would predict greater sympathy for the player over the injury and happiness upon learning of his recovery. Thus, the socially undesirable emotions of schadenfreude and gluckschmerz should characterize reactions to learning about a rival's misfortune and subsequent rehabilitation among highly identified fans, whereas more socially acceptable reactions of sympathy and happiness should better describe the emotions among less identified fans when they learn of these events.

A final goal was to examine other factors that might mediate any relation found between in-group identification and schadenfreude as well as between in-group identification and gluckschmerz. For schadenfreude, we expected that perceived in-group gain, perceptions that the outgroup deserved the misfortune, and dislike of the outgroup would mediate the relationship. For gluckschmerz, we expected mediational effects conceptually similar to schadenfreude, given that gluckschmerz, like schadenfreude, should be triggered by changes in an outgroup's fortunes, and by extension, one's own group's fortunes (Combs et al. 2009).

Method

Participants

Thirty-six introductory social psychology students volunteered as part of a group of studies on social emotions. Participation was unrelated to course grades, and the experimenter distributed the materials when the instructor was absent from the classroom. We did not collect gender information, but approximately equal numbers of males and females were in the course.

Materials and procedure

Aside from taking place in a classroom setting, the overall procedure for Study 2 was similar to Study 1's, except that participants read and reacted to two stimulus news articles. Additionally, participants completed the measures of in-group identification (SSIS, $\alpha = .94$) and general fandom (SFQ, $\alpha = .95$) during a mass-testing session approximately 5 weeks before the experimental procedure took place.

The news articles in Study 2 described (1) an apparently severe knee injury sustained by an important player for Duke University (Nolan Smith) during a Duke win over Loyola (University) of Maryland and (2) his unexpected quick recovery. Participants then completed composite measures of schadenfreude ("A little pleased over the injury;" "Delighted over what happened;" and "I have to admit I smiled a bit;" $\alpha = .93$), and sympathy over the injury ("Sad for Nolan Smith;" "Sorry for Duke;" "Compassion for Nolan Smith;" "Disappointed for Duke;" $\alpha = .78$), and single-item measures of perceived in-group gain ("Happy because it helps Kentucky"), outgroup deservedness ("Duke deserves these kinds of things"), and dislike ("Dislike toward Duke"). As with Study 1, these and the other dependent measures in Study 2 were on eight-point Likert scales (endpoints: 0 = "not at all;" 7 = "a whole lot").

After reading the second article about Smith's recovery, participants completed a three-item measure of gluckschmerz ($\alpha = .83$). Items included "A little disappointed over the quick recovery;" "Displeased over what happened;" and "Have to admit it came as a disappointment." Happiness over the recovery ($\alpha = .76$) was measured with four items: "Pleased for Smith;" "Pleased for Duke;" "Happy for Smith;" and "Happy for Duke." Participants also indicated the extent to which they believed the recovery hurt Kentucky ("Upset because since [sic] it hurts Kentucky"), and feelings of resentment ("resentful").

Results

Controlling for general fandom ($M = 4.31$, $SD = 1.96$), group identification ($M = 4.52$, $SD = 1.86$) was positively correlated with schadenfreude ($M = 1.04$, $SD = 1.41$) in reaction to learning of Smith's injury, $r = .50$, $p = .001$, $\tau = .38$, $p = .002$, and gluckschmerz ($M = 1.06$, $SD = 1.21$) in reaction to Smith's recovery, $r = .58$, $p < .001$, $\tau = .44$, $p < .001$; descriptively, group identification correlated negatively with happiness over Smith's recovery ($M = 2.03$, $SD = 1.29$), $r = -.24$, $p = .16$, $\tau = -.15$, $p = .21$, as well as sympathy over Smith's injury ($M = 2.13$, $SD = 1.28$), $r = -.20$, $p = .24$, $\tau = -.16$, $p = .18$, albeit nonsignificantly. See Table 3 for zero-order correlations.

In-group identification and schadenfreude

In a regression analysis controlling for general sport fandom, in-group identification was associated with schadenfreude, $b = 0.46$, $SE_{\text{HC4m}} = 0.13$, $t = 3.51$, $p = .001$, model $R^2 = .30$, $p = .002$. Including a quadratic in-group identification term resulted in no significant increase in model R^2, $\Delta R^2 = .05$, $F = 2.45$, $p = .13$. Sport fandom had no significant effect on schadenfreude, $p = .34$. Repeating the regression with log-schadenfreude as the outcome yielded essentially identical results, with only in-group identification showing a significant association with the outcome, $b = 0.19$, $SE_{\text{HC4m}} = 0.06$, $t = 3.41$, $p = .002$.

To test for potential mediators of the linear relationship between identification and schadenfreude, we took an approach similar to that of Study 1—potential mediators were entered simultaneously and individually into mediated multiple regressions controlling for general sport fandom. Perceived in-group gain ($M = 2.36$, $SD = 2.23$), outgroup deservedness ($M = 1.25$, $SD = 2.03$), and dislike of the outgroup ($M = 2.81$, $SD = 2.66$) were examined as possible mediators of the link between in-group identification and schadenfreude in reaction to Smith's injury. Whether entered simultaneously or individually, none was a significant mediator of the identification-schadenfreude

Table 3 Measures of association, Study 2, N = 36

	1	2	3	4	5	6	7	8	9	10	11
1 In-group identification	–	.33	.425	.567	.356	.516	−.207	.434	.374	.538	−.255
p		**.001**	**.001**	**<.001**	**.007**	**<.001**	.087	**.001**	**.005**	**<.001**	**.033**
2 Sport fandom	.495	–	.19	.423	.346	.254	−.115	.09	.098	.229	−.255
p	**<.001**		.139	**.001**	**.009**	**.048**	.343	.484	.47	.071	**.035**
3 Schadenfreude	.538	.244	–	.441	.575	.435	−.247	.629	.623	.508	−.324
p	**.001**	.152		**.001**	**<.001**	**.001**	.056	**<.001**	**<.001**	**<.001**	**.012**
4 Dislike of outgroup	.675	.578	.514	–	.616	.593	−.254	.4	.353	.588	−.285
p	**<.001**	**<.001**	**.001**		**<.001**	**<.001**	**.046**	**.003**	**.013**	**<.001**	**.024**
5 Outgroup deservedness	.349	.496	.494	.712	–	.37	−.261	.438	.542	.517	−.334
p	**.037**	**.002**	**.002**	**<.001**		**.009**	.052	**.002**	**<.001**	**<.001**	**.012**
6 In-group gain	.627	.377	.467	.676	.364	–	−.233	.417	.303	.704	−.185
p	**<.001**	**.023**	**.004**	**<.001**	**.029**		.072	**.002**	**.036**	**<.001**	.149
7 Sympathy	−.238	−.1	−.365	−.28	−.317	−.209	–	−.004	−.074	−.16	.557
p	.162	.561	**.029**	.098	.059	.221		.976	.587	.211	**<.001**
8 Gluckschmerz	.575	.206	.765	.466	.368	.475	.008	–	.735	.598	−.121
p	**<.001**	.234	**<.001**	**.005**	**.03**	**.004**	.964		**<.001**	**<.001**	.348
9 Resent recovery	.477	.214	.725	.385	.396	.296	−.14	.883	–	.564	−.212
p	**.003**	.209	**<.001**	**.021**	**.017**	.08	.417	**<.001**		**<.001**	.119
10 In-group loss	.711	.407	.57	.735	.501	.808	−.15	.751	.65	–	−.239
p	**<.001**	**.015**	**<.001**	**<.001**	**.002**	**<.001**	.389	**<.001**	**<.001**		.06
11 Happy for recovery	−.388	−.317	−.395	−.372	−.369	−.235	.697	−.161	−.32	−.299	–
p	**.019**	.06	**.017**	**.025**	**.027**	.167	**<.001**	.355	.057	.081	
M	4.52	4.31	1.04	2.81	1.25	2.36	2.13	1.06	0.75	1.39	2.03
SD	1.86	1.96	1.41	2.66	2.03	2.23	1.28	1.21	1.18	1.38	1.29

Above diagonal: Kendall's τ-b rank correlation coefficients

Below diagonal: Pearson correlation coefficients

Bold means $p < .05$

relationship, or the identification-log schadenfreude relationship.

In-group identification and gluckschmerz

In a regression analysis controlling for general sport fandom, in-group identification was significantly associated with gluckschmerz in reaction to the Duke player's recovery, $b = 0.45$, $SE_{\text{HC4m}} = 0.10$, $t = 4.70$, $p < .001$, model $R^2 = .37$, $p < .001$. As with schadenfreude, adding the quadratic term did not significantly increase model R^2, $\Delta R^2 < .01$, $F_{\text{change}} = .14$, $p = .71$, and sport fandom's effect on gluckschmerz was not significant, $b = -0.15$, $SE_{\text{HC4m}} = 0.10$, $p = .14$. Also, and as expected, those who felt schadenfreude in reaction to the injury tended to feel gluckschmerz upon the player's recovery, $r = .77$, $p < .001$, $\tau = .63$, $p < .001$. Paralleling the results on log-schadenfreude, repeating the regression with log-gluckschmerz as the outcome also yielded essentially identical results, with only in-group identification showing a significant association with the outcome, $b = 0.21$, $SE_{\text{HC4m}} = 0.04$, $t = 5.31$, $p < .001$.

To test possible mediators of the relationship between in-group identification and gluckschmerz, perceptions of the recovery hurting Kentucky ($M = 1.39$, $SD = 1.38$), resentment ($M = 0.75$, $SD = 1.18$), and outgroup dislike were entered simultaneously and individually into mediated regression equations. The first two mediators were chosen (in addition to dislike) because negative feelings due to the recovery "hurting" Kentucky are logically related to happiness over the initial injury helping Kentucky ($r = .81$, $p < .001$, $\tau = .74$, $p < .001$), while resentment of the *good* fortune of recovery should be related to perceptions of the outgroup's deservedness of *mis*fortune ($r = .40$, $p = .02$, $\tau = .54$, $p < .001$).

Mediation analyses revealed that only resentment was a significant mediator of the group identification—gluckschmerz relationship when entered simultaneously with dislike and perceptions of the recovery hurting Kentucky, $b = 0.23$, $SE_{\text{HC3}} = 0.08$, 95 % CI (0.09, 0.43). Entered individually, however, all three variables mediated the in-group identification-gluckschmerz relationship: perceptions of the recovery hurting Kentucky, $b = 0.31$, $SE_{\text{HC3}} = 0.09$, 95 % CI (0.16, 0.49); resentment, $b = 0.26$, $SE_{\text{HC3}} = 0.09$, 95 % CI (0.11, 0.46); and dislike, $b = 0.07$, $SE_{\text{HC3}} = 0.08$, 95 % CI (−0.008, 0.32), although its effect was marginal.

Discussion

The results of Study 2 suggest that gluckschmerz is an emotion that people can feel and that it, like schadenfreude, is associated with group identification. The more participants identified with their team, the more gluckschmerz they tended to report following the rival player's good fortune. This was true even though the injury was severe. As expected, schadenfreude and gluckschmerz, although apparently opposite in their affective quality, were highly related. If participants initially felt happy over the rival player's injury, they also were highly likely to feel gluckschmerz if the player recovered. Mediational findings were less clear-cut (perhaps in part because statistical power was low with $N = 36$). None of the possible mediators of the association between in-group identification and schadenfreude was statistically significant. On the other hand, in single-mediator models, resentment, dislike of Duke, and perceived in-group loss due to the recovery all mediated the relationship between in-group identification and gluckschmerz, although only resentment remained significant in the multiple-mediation model, indicating quite a bit of overlap among these closely interrelated emotional experiences. Nonetheless, Studies 1 and 2 show that in-group identification is associated with schadenfreude and gluckschmerz in response to an outgroup's fortunes, whether a loss, an injury, or recovery from an injury.

Study 3

Although the findings for Study 2 suggest that, for the highly identified fan, severe misfortunes (even injuries) happening to a rival can produce schadenfreude and gluckschmerz if the rival recovers, severity was not actually manipulated. This was in part because we were relying on actual events, which precluded varying the severity of an injury to the same rival player. We were able to examine gluckschmerz (in Study 2) because, fortunately, the rival player actually made a quick recovery. In Study 3, we manipulated the severity of misfortune by creating what appeared to be an actual misfortune of either a mild or a severe nature. In this case, we chose Austin Rivers, arguably the best player for Duke University during the 2011–2012 season. As in Study 2, participants read two articles. The first article described either a mild (wrist) injury (though this would cause him to be out for the season) or severe (knee) injury (out for the season and possibly jeopardize NBA career) and the second described a report indicating that the injury was not as bad as expected and that the player would soon return to the lineup. Then, participants completed group identification measures. As gender covaries with sport fandom and could potentially underlie in-group identification-schadenfreude/gluckschmerz associations, we also measured gender in this and the final study. We expected that group identification would be associated with both schadenfreude and

gluckschmerz, but this would be moderated by severity—such that highly identified participants would feel less schadenfreude as injury severity increased and also less gluckschmerz over the subsequent recovery, while low-identified participants would show similarly low levels of schadenfreude and gluckschmerz regardless of injury severity. Our predictions for high identified participants were tempered by the recognition that, in the context of sports, a more severe injury also produces the possibility for greater gain to the in-group. Thus, the satisfaction resulting from this greater gain might trump the greater sympathy created by the increased severity of the injury.

Method

Participants

Sixty-one students at the University of Kentucky participated to receive partial course credit. After removing outlying observations,[2] 57 students (34 female) remained for analysis.

Materials and procedure

Participants were run in a laboratory setting in groups of approximately 8–15 and were randomly assigned to one of two conditions: reading an article about a season-ending severe knee injury that put a star Duke University player's (Austin Rivers') aspirations for an NBA career into doubt, or a less serious wrist injury that would put him out for the season but not threaten his prospects of a professional career. After giving their reactions to the injury, participants then read a subsequent article describing how Rivers' injury was not as bad as expected and his likely return to the lineup that season. For the minor wrist injury, Rivers was described as probably being ready to return "in February," or in time for the NCAA Tournament. For believability's sake, in the severe knee injury condition participants instead read that he would most likely return "in late February," as the study was run during January of that year. We reasoned that this difference was of little consequence except for reducing suspicion. Then, participants provided their reactions to that news. Lastly, they completed the in-group identity and general sports fandom measures, the SSIS ($\alpha = .94$) and SFQ ($\alpha = .95$).

The measures were similar to Study 2's, except as noted. We expanded the three-item schadenfreude scale, yielding a five-item scale ($\alpha = .78$). To measure perceived in-group gain as a result of the injury, we averaged 2 items ("Happy if it hurt Duke" and "Happy because it helps Kentucky;" $\alpha = .64$); a two-item scale was also formed to measure perceived in-group loss as a result of recovery from the injury ("Upset because it hurts Kentucky" and "Unhappy because it helps Duke;" $\alpha = .73$). Composites for sympathy over the injury ($\alpha = .74$), gluckschmerz ($\alpha = .82$), and happiness over the recovery ($\alpha = .83$) were also adequately reliable.

Results

Controlling for general fandom and participant gender, identification with UK's basketball team (in-group identification) correlated positively with schadenfreude in reaction to learning of Rivers' injury, $r = .36$, $p = .004$, $\tau = .26$, $p = .005$, and with gluckschmerz following his recovery, $r = .43$, $p = .001$, $\tau = .28$, $p = .002$. Although both correlations were descriptively negative, identification was not significantly related to sympathy after the injury, $r = -.10$, $p = .45$, $\tau = .09$, $p = .34$, or happiness over the recovery, $r = -.19$, $p = .16$, $\tau = -.06$, $p = .50$, controlling for fandom and gender. See Table 4 for zero-order correlations.

Males tend to be bigger sports fans than females, and so we performed analyses to assess what effect, if any, gender would have on results (Wann et al. 2004). Although males and females differed slightly on in-group identification ($M_{Male} = 5.78$, $SD_{Male} = 1.66$; $M_{Female} = 5.12$, $SD_{Female} = 2.13$), sport fandom ($M_{Male} = 5.89$, $SD_{Male} = 2.15$; $M_{Female} = 5.04$, $SD_{Female} = 2.27$), schadenfreude ($M_{Male} = .84$, $SD_{Male} = 1.10$; $M_{Female} = .62$, $SD_{Female} = .94$), and gluckschmerz ($M_{Male} = 1.29$, $SD_{Male} = 1.64$; $M_{Female} = 1.63$, $SD_{Female} = 1.62$), none of these differences was statistically reliable, ts < 1.5, ps $> .20$. Moreover, whether controlling for sport fandom and in-group identification or not, gender was not reliably associated with any of these variables, $|r$s$| < .11$, $|\tau$s$| < .12$, ps $> .20$. Nonetheless, in addition to sport fandom, gender was included as a second covariate in subsequent analyses, as previous research has indicated that females tend to express less schadenfreude than males (Combs et al. 2009).

Manipulation check

A separate group of participants (17 females and 18 males) was used to check on whether the conditions would be perceived as distinct in terms of misfortune severity. Using a four-item composite measure of participants' perceptions of Rivers' injury severity ($\alpha = .87$), we confirmed that the knee injury ($M = 5.22$, $SD = .93$) was seen as considerably more severe than the wrist injury ($M = 3.23$, $SD = 1.33$), $t = 4.94$, $p < .001$, $d = 1.74$.

[2] Four outliers were removed from analyses on the basis of exceeding conventional cutoffs for at least two of the following measures in regressions of schadenfreude against in-group identification: leverage [cutoff = $3((k + 1)/n)$], ESR (cutoff = ± 3), and DFBetas (cutoff = ± 1).

Table 4 Measures of association, Study 3, N = 57

	1	2	3	4	5	6	7	8	9	10	11	12
1 In-group identification	–	.373	.264	.52	.165	.47	−.078	.262	.212	.429	−.046	.104
p		**<.001**	**.008**	**<.001**	.118	**<.001**	.404	**.007**	**.045**	**<.001**	.623	.351
2 Sport fandom	.506	–	.095	.252	.132	.106	.038	.051	.229	.228	.134	.231
p	**<.001**		.342	**.011**	.215	.274	.689	.6	**.032**	**.018**	.156	**.039**
3 Schadenfreude	.375	.185	–	.422	.381	.466	−.285	.555	.407	.296	−.168	−.134
p	**.004**	.168		**<.001**	**.001**	**<.001**	**.005**	**<.001**	**<.001**	**.004**	.097	.262
4 Dislike of outgroup	.595	.357	.502	–	.468	.537	−.268	.389	.156	.464	−.207	.142
p	**<.001**	**.006**	**<.001**		**<.001**	**<.001**	**.007**	**<.001**	.169	**<.001**	**.039**	.231
5 Outgroup deservedness	.198	.254	.429	.526	–	.351	−.22	.407	.267	.267	−.16	.085
p	.139	.057	**.001**	**<.001**		**.001**	**.038**	**<.001**	**.027**	**.014**	.134	.503
6 In-group gain	.617	.239	.581	.644	.448	–	−.195	.462	.145	.617	−.217	.024
p	**<.001**	.073	**<.001**	**<.001**	**<.001**		**.043**	**<.001**	.185	**<.001**	**.025**	.833
7 Sympathy	−.092	.052	−.428	−.378	−.317	−.309	–	−.148	−.081	−.035	.59	.126
p	.494	.701	**.001**	**.004**	**.016**	**.019**		.131	.447	.717	**<.001**	.26
8 Gluckschmerz	.4	.149	.662	.464	.459	.617	−.238	–	.505	.556	−.234	.017
p	**.002**	.269	**<.001**	**<.001**	**<.001**	**<.001**	.075		**<.001**	**<.001**	**.018**	.882
9 Resent recovery	.248	.323	.425	.211	.458	.188	−.058	.563	–	.394	−.013	.017
p	.063	**.014**	**.001**	.115	**<.001**	.162	.67	**<.001**		**<.001**	.9	.893
10 In-group loss	.562	.336	.409	.547	.41	.711	−.081	.699	.558	–	−.168	.136
p	**<.001**	**.011**	**.002**	**<.001**	**.002**	**<.001**	.55	**<.001**	**<.001**		.083	.236
11 Happy for recovery	−.176	.041	−.287	−.392	−.259	−.314	.721	−.362	−.092	−.297	–	−.009
p	.191	.761	**.03**	**.003**	.051	**.017**	**<.001**	**.006**	.497	**.025**		.936
12 Injury (0 = minor, 1 = severe)	.163	.323	−.128	.18	.106	.005	.17	−.058	−.041	.136	−.05	–
p	.226	**.014**	.342	.181	.433	.97	.206	.67	.763	.313	.713	
M	5.38	5.38	0.71	3.3	0.68	2.37	3.42	1.49	0.67	2.63	2.81	
SD	1.97	2.24	1	2.88	1.31	2.06	1.38	1.62	1.46	2.28	1.54	

Above diagonal: Kendall's τ-b rank correlation coefficients

Below diagonal: Pearson correlation coefficients

Bold means $p < .05$

In-group identification, schadenfreude, and gluckschmerz

Schadenfreude was subdued in both the minor injury ($n = 32$, $M = .83$, $SD = 1.08$) and severe injury ($n = 25$, $M = .57$, $SD = .89$) conditions. We performed a hierarchical linear regression analysis, with general fandom and gender as control variables, to test for main effects of in-group identification and injury type at Step 1 and added their interaction to the model at Step 2. Results indicated a main effect of in-group identification, $b = 0.19$, $SE_{\text{HC4m}} = 0.08$, $t = 2.38$, $p = .02$, but no significant main effect of injury type, $b = -0.43$, $SE_{\text{HC4m}} = 0.30$, $t = -1.42$, $p = .16$, sport fandom $b = 0.02$, $SE_{\text{HC4m}} = 0.07$, $t = 0.36$, $p = .72$, or gender (0 = male, 1 = female), $b = -0.13$, $SE_{\text{HC4m}} = 0.29$, $t = -.47$, $p = .64$, model $R^2 = .18$, $p = .03$. Adding the interaction effect did not significantly improve the model, $\Delta R^2 = .01$, $F_{\text{change}} = .74$, $p = .39$, and there was no significant quadratic effect of in-group identification, $p > .35$. Gender and fandom had no significant effect on schadenfreude, $ps > .19$. Results of a regression with log-schadenfreude as the outcome yielded similar results. Only in-group identification showing a significant association with log-schadenfreude, $b = 0.09$, $SE_{\text{HC4m}} = 0.04$, $t = 2.20$, $p = .03$.

Gluckschmerz was similar across injury conditions ($M_{\text{Minor Injury}} = 1.57$, $SD_{\text{Minor Injury}} = 1.90$; $M_{\text{Severe Injury}} = 1.39$, $SD_{\text{Severe Injury}} = 1.20$). A regression analysis on gluckschmerz with predictors identical to those for the schadenfreude regression analysis revealed a main effect of in-group identification, $b = 0.37$, $SE_{\text{HC4m}} = 0.11$, $t = 3.23$, $p = .002$, but not of injury type, $b = -0.34$, $SE_{\text{HC4m}} = 0.48$, $t = -0.69$, $p = .49$, model $R^2 = .20$, $p = .02$; adding the interaction effect did not improve the model, $\Delta R^2 < .01$, $p > .90$, and there was no quadratic effect of in-group identification, $p > .90$. Gender and fandom had no significant effect on gluckschmerz, $ps > .25$.

The log-gluckschmerz version of the regression also showed only a significant main effect of in-group identification, $b = 0.16$, $SE_{HC4m} = 0.05$, $t = 2.97$, $p = .004$.

Discussion

The severity of an injury did not moderate the relationships between identification and schadenfreude, and identification and gluckschmerz, even though the more severe injury was indicated to be career-threatening. Schadenfreude in reaction to a rival player's injury and gluckschmerz in reaction to his recovery were highly related, $r = .66, p < .001, \tau = .56$, $p < .001$, as were perceived gain in reaction to the injury and perceived loss in reaction to his recovery, $r = .71, p < .001$, $\tau = .62$, $p < .001$. As expected, schadenfreude and gluckschmerz, although apparently opposite in their affective quality, were strongly associated. If participants initially felt happy over the rival player's injury, they also were highly likely to feel gluckschmerz if the player recovered. Thus, it seems likely that emotional reactions to positive and negative events happening to an outgroup are often driven in large part by their perceived consequences for one's in-group. People heavily invested in a particular identity are likely to feel the pain of another group's good fortune, and the joys of learning of that group's misfortune, as these events impact their group's (and their own) fortunes.

Study 4

It is likely that people react differently to another person's physical pain than to a misfortune unrelated to physical pain (e.g., Bruneau et al. 2013). Possibly, another person's physical pain is more likely to create immediate empathy, for example (but see Krach et al. 2011). Injury severity and pain often coincide, and so separating their effects and determining whether they might influence in-group identification effects on schadenfreude in reaction to an outgroup misfortune and gluckschmerz following recovery was the primary goal of Study 4. We expected that injury severity (and its implied consequences for the in-group) would play a greater role in generating schadenfreude among highly identified fans than the outgroup player's pain, if the pain itself played any role at all. Notably, the sample size was much greater ($N = 279$) than those of the first 3 studies, enhancing statistical power, especially for detecting smaller effects. Importantly, the larger sample enabled us to perform two-part modeling, in which we separately modeled the presence or absence of schadenfreude and gluckschmerz using logistic regression and the intensity of these emotions, given their existence, using log-Y regression to deal with positive skew of the outcome. We had no reason a priori to expect that mediation of in-group identification effects would differ across the two parts of the models; nevertheless, we were able to test whether the mediators of the presence models were the same or different from those of the intensity models using Hayes' (2013) PROCESS SPSS macro, which allows mediation tests for both continuous and dichotomous outcomes. In other words, the present study allowed us to model reasons why in-group identification may determine both whether and the extent to which people have socially-inappropriate reactions to positive and negative events happening to outgroups.

Method

Participants

University of Kentucky students participated in partial fulfillment of the research participation component of an introductory psychology course. One outlier was removed from analyses, as the participant scored above cut-offs on leverage and DFBetas on both schadenfreude and gluckschmerz in regressions of those variables against in-group identification. The final sample included 105 males and 174 females.

Materials and procedure

Participants read two news articles (ostensibly from a Duke fan website) about either of two star players for Duke. The actual player was either Ryan Kelly or Mason Plumlee, both of whom were key, equally valuable players on the Duke men's basketball team. Also, the essential details about the injuries did not vary. Three one-way ANOVAs (with post hoc Tukey's HSD tests) on the effect of player (either Kelly or one of two Plumlee studies) on schadenfreude, gluckschmerz, and in-group identification, respectively, revealed no significant differences among any of the studies on any of these measures, Fs < 1.5, ps $> .27$; all Tukey's HSD p values $>.24$. Thus, subsequent analyses were collapsed across the Kelly and Plumlee studies.

The first article participants read discussed an injury to the player's knee (suffered that day during practice) that was witnessed by someone attending the practice session and detailed either a small or large amount of pain suffered by the player. Specifically, the player was described as either having experienced little pain ($n = 135$) or as having screamed in pain ($n = 144$). The article went on to give a preliminary assessment of its severity, which could take one of two levels: healthy in time for the season opener ($n = 115$) or miss at least an entire season ($n = 164$).[3] Thus, we had a 2(injury

[3] Participants in this condition ($n = 164$) either read that the player would miss an entire season ($n = 111$) or would very likely never play basketball competitively again ($n = 53$). Results were very similar across these variants and thus we combined them to form a single severe injury condition.

pain) × 2(injury severity) between-subjects design. Measures of schadenfreude ($\alpha = .90$; $M = 1.03$, $SD = 1.51$) in response to the injury were then collected, along with measures of in-group gain ($\alpha = .77$; $M = 2.74$, $SD = 2.31$), outgroup dislike (1-item: "Dislike Duke;" $M = 3.41$, $SD = 2.93$) and the perceived deservedness of the misfortune (1-item: "Duke deserves these kinds of things;" $M = 1.15$, $SD = 1.90$). Next, participants read the second article reporting that the player would, in fact, recover in time for playing in the season opener (worded to take into account that this outcome might have seemed surprising given the apparent nature of the injury as initially perceived), after which participants indicated feelings of gluckschmerz ($\alpha = .85$; $M = 1.75$, $SD = 1.85$), perceptions of in-group loss ($\alpha = .84$; $M = 2.58$, $SD = 2.30$), and resentment over the recovery (measured with items "Resentful" and "Frustrated;" $\alpha = .85$; $M = 0.86$, $SD = 1.48$). Finally, participants completed measures of in-group identification ($\alpha = .94$; $M = 5.55$, $SD = 1.95$), and general sport fandom ($\alpha = .95$; $M = 5.40$, $SD = 2.20$) before being thanked and debriefed.

Results

Manipulation checks

Items on eight-point Likert scales (endpoints: 0 = "not at all;" 7 = "a whole lot") assessed the effectiveness of the injury severity and injury painfulness manipulations. A 2 [injury severity: low (player back in time for season opener) or high (player out for at least a season)] × 2 [pain: low (injury caused little pain) or high (player screamed in pain)] factorial ANOVA on agreement with the statement "I expect that Kelly will recover quickly" yielded a main effect of injury severity, $F(1, 275) = 62.99$, $p < .001$, $\eta_p^2 = .19$, confirming that participants who read about an injury of low severity ($M = 4.51$, $SD = 1.69$) expected the player to recover faster than those who read about a severe injury ($M = 2.72$, $SD = 1.98$). There was no main effect of pain, $\eta_p^2 < .01$, $p = .47$, or interaction, $\eta_p^2 < .01$, $p = .35$.

A second ANOVA using the statement "The injury was painful" confirmed low injury pain participants ($M = 3.47$, $SD = 2.15$) perceived the player to be in less pain than those in the high injury pain condition ($M = 4.67$, $SD = 1.98$), $F(1, 111) = 9.85$, $p = .002$, $\eta_p^2 = .08$ (Participants who read about an injury to Ryan Kelly ($n = 164$) were not asked about the injury's painfulness.). There was no main effect of injury severity on perceptions of pain, $F(1, 111) = 0.26$, $p = .61$, $\eta_p^2 < .01$. However, a marginally significant injury pain × injury severity interaction was obtained, $F(1, 111) = 3.72$, $p = .056$, $\eta_p^2 = .03$. Probing the interaction revealed that although the high pain condition participants perceived the injury to be more painful than the low-pain injury participants, this effect was only significant when the injury was minor, $b = 1.93$, $SE = 0.54$, 95 % CI (0.87–3.00); severe injury: $b = 0.46$, $SE = 0.54$, 95 % CI (−0.61 to 1.54).

In-group identification, schadenfreude, gluckschmerz, and gender

Controlling for general fandom and gender, in-group identification was positively correlated with schadenfreude in reaction to learning of the player's injury, $r = .29$, $p < .001$, $\tau = .26$, $p < .001$, and gluckschmerz in reaction to his recovery, $r = .35$, $p < .001$, $\tau = .27$, $p < .001$; identification also correlated negatively with sympathy over the injury, $r = -.23$, $p < .001$, $\tau = -.19$, $p < .001$, and happiness over the recovery, $r = -.25$, $p < .001$, $\tau = -.20$, $p < .001$. After partialling out general fandom and in-group identification effects, female participant gender was associated with greater self-reported sympathy in reaction to the injury, $r = .15$, $p = .01$, $\tau = .10$, $p = .01$, but no greater happiness over the recovery than that reported by male participants, $r = .04$, $p = .50$, $\tau = .01$, $p = .78$. See Table 5 for zero-order correlations.

Two-part modeling, schadenfreude

A logistic regression analysis tested the effects of in-group identification (and the quadratic identification term), injury severity condition, pain condition, general fandom, and gender on whether participants self-reporting feeling any schadenfreude in response to the injury.[4] Results indicated that in-group identification significantly predicted the presence of schadenfreude in reaction to the injury, OR 1.58, 95 % CI (1.30–1.95), $p < .001$; there was also a marginally significant quadratic effect of identification, OR 1.06, 95 % CI (0.993–1.14), $p = .079$. There was no significant effect of injury severity, OR 0.86, 95 % CI (0.51–1.45), $p = .57$, but reading about a painful injury tended to lower the likelihood of expressing any schadenfreude, OR 0.63, 95 % CI (0.38–1.06), $p = .084$. Female participants were less likely than males to report schadenfreude, OR 0.53, 95 % CI (0.30–0.94), $p = .03$. General fandom had no effect, OR 1.02, $p = .82$.

Repeating the regression analysis to determine predictors of the log-intensity of schadenfreude ($n = 152$, as 127 participants reported no schadenfreude) yielded similar results.[5]

[4] Neither of the two-way interaction terms nor the three-way interaction was statistically significant, $ps > .30$, so the interaction terms were dropped from the presence of schadenfreude model. The final model Cox–Snell R^2 was .15, $p < .001$.

[5] Neither of the two-way interaction terms nor the three-way interaction was statistically significant, $ps > .50$, so the interaction terms were dropped from the intensity of schadenfreude model. The final model R^2 was .16, $p < .001$.

Table 5 Measures of association, Study 4, N = 279

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 In-group identification	–	.371**	.310**	.498**	.322**	.472**	−.199**	.306**	.246**	.436**	−.207**	.104*	.01	.021	−.088
2 Sport fandom	.497**	–	.202**	.327**	.174**	.226**	−.061	.150**	.140**	.165**	−.056	.140**	−.017	.038	−.275**
3 Schadenfreude	.347**	.240**	–	.458**	.523**	.541**	−.296**	.564**	.502**	.465**	−.246**	.489**	−.046	−.050	−.180**
4 Dislike of outgroup	.591**	.447**	.507**	–	.492**	.521**	−.298**	.372**	.296**	.441**	−.267**	.212**	−.016	.041	−.185**
5 Outgroup deservedness	.356**	.235**	.593**	.535**	–	.502**	−.298**	.456**	.390**	.472**	−.254**	.418**	.049	.072	−.189**
6 In-group gain	.602**	.335**	.644**	.633**	.586**	–	−.319**	.562**	.438**	.641**	−.284**	.320**	−.052	.025	−.119*
7 Sympathy	−.229**	−.079	−.424**	−.383**	−.381**	−.448**	–	−.270**	−.225**	−.267**	.653**	−.151**	.034	.037	.112*
8 Gluckschmerz	.399**	.227**	.728**	.467**	.567**	.705**	−.414**	–	.575**	.622**	−.279**	.360**	−.037	.010	−.094
9 Resent recovery	.294**	.175**	.648**	.331**	.488**	.506**	−.315**	.717**	–	.509**	−.207**	.368**	−.047	−.023	−.075
10 In-group loss	.568**	.260**	.567**	.542**	.589**	.780**	−.380**	.763**	.599**	–	−.283**	.262**	.009	.054	−.01
11 Happy for recovery	−.254**	−.085	−.338**	−.379**	−.322**	−.404**	.811**	−.396**	−.270**	−.402**	–	−.127**	.051	.004	.02
12 Happiness about pain	.119*	.143*	.616**	.231**	.423**	.345**	−.182**	.440**	.526**	.310**	−.147*	–	.027	−.078	−.223**
13 Pain condition[a]	.019	−.027	−.016	−.018	.037	−.063	.029	−.016	−.031	.017	.068	.027	–	−.039	−.012
14 Injury severity[b]	.041	.045	−.088	.041	.119*	.020	.053	.004	−.032	.054	.005	−.092	−.039	–	−.019
15 Female participant	−.074	−.309**	−.208**	−.201**	−.194**	−.144*	.146*	−.121*	−.068	−.012	.039	−.208**	−.012	−.019	–
M	5.55	5.4	1.03	3.41	1.15	2.74	3.28	1.75	0.86	2.58	2.65	0.41			
SD	1.95	2.2	1.51	2.93	1.9	2.31	1.56	1.85	1.48	2.3	1.72	1.11			

Above diagonal: Kendall's τ-b rank correlation coefficients

Below diagonal: Pearson correlation coefficients

** $p < .01$

* $p < .05$

[a] Little pain = 0, screamed in pain = 1

[b] Back in time for season opener = 0, out for season or longer = 1

Specifically, there were linear, $b = 0.10$, $SE_{HC4m} = 0.03$, $t = 3.37$, $p < .001$, and quadratic, $b = 0.03$, $SE_{HC4m} = 0.01$, $t = 2.38$, $p = .02$, effects of in-group identification, although female gender was only marginally associated with lower schadenfreude intensity, $b = -0.14$, $SE_{HC4m} = 0.08$, $t = -1.67$, $p = .096$. As with the presence model, general fandom had no significant effect on the intensity of schadenfreude, $b < 0.01$, $p = .85$, nor did injury severity, $b = -0.13$, $SE_{HC4m} = 0.08$, $t = -1.59$, $p = .11$. In contrast to its effect on whether any schadenfreude at all was reported, pain severity condition did not predict schadenfreude intensity, $b = 0.05$, $p = .51$.

Mediation analyses, schadenfreude Multiple mediation analysis on the linear effect of in-group identification on schadenfreude's presence (controlling for gender, injury severity, and injury painfulness) with perceived in-group gain, outgroup dislike, outgroup deservedness, and the item "happy because of his pain" entered as mediators revealed that perceived in-group gain, OR 1.40, 95 % CI (1.18–1.72), and dislike of the outgroup, OR 1.18, 95 % CI (1.05–1.34), significantly mediated the effect, while deservedness was a marginally significant mediator, OR 1.07, 95 % CI (0.98–1.26), and happiness over the pain had no statistically reliable effect, OR 1.24, 95 % CI (0.81–1.79). There was no significant direct effect of identification, OR 0.94, 95 % CI (0.74–1.19).

Mediation analysis of the log-intensity of schadenfreude generated results that closely paralleled those on the presence of schadenfreude. There were significant indirect effects of in-group identification via gain, $b = 0.06$, $SE_{HC3} = 0.02$, 95 % CI (0.03–0.10) and dislike, $b = 0.03$, $SE_{HC3} = 0.01$, 95 % CI (0.0004–0.06), and a marginally significant effect via deservedness, $b = 0.015$, $SE_{HC3} = 0.01$, 95 % CI (−0.003–0.04), whereas happiness over the pain again had no significant mediating effect, $b = -0.0034$, $SE_{HC3} = 0.01$, 95 % CI (−0.03 to 0.02), and there was no significant direct effect of identification, $b = -0.03$, $SE_{HC3} = 0.02$, 95 % CI (−0.08 to 0.02).

Two-part modeling, gluckschmerz

Modeling of the presence/absence of gluckschmerz was conducted with the same predictors as those for the schadenfreude logistic regression. Similarly to those results, in-group identification significantly predicted the presence of gluckschmerz in reaction to the player's recovery, OR 1.44, 95 % CI (1.17–1.78), $p < .001$, there was no significant effect of injury severity, OR 0.96, 95 % CI (0.55–1.65), $p = .88$, or of general fandom, OR 0.94, 95 % CI (0.81–1.08), $p = .39$, and reading about recovery from a very painful injury tended to lower the likelihood of expressing any gluckschmerz, OR 0.61, 95 % CI (0.35–1.06), $p = .081$. In contrast with the presence of schadenfreude results, however, there was no quadratic effect of identification on the likelihood of expressing gluckschmerz, OR 0.98, 95 % CI (0.91–1.05), $p = .52$, and female participants were not significantly less likely than males to report gluckschmerz, OR 0.67, 95 % CI (0.36–1.22), $p = .19$. Cox–Snell R^2 for the model was .12, $p < 001$.

Repeating the regression analysis to determine predictors of the log-intensity of gluckschmerz ($n = 189$; no gluckschmerz was reported by 90 participants) yielded results largely similar to those for schadenfreude's log-intensity. Specifically, we found linear, $b = 0.11$, $SE_{HC4m} = 0.03$, $t = 4.20$, $p < .001$, and quadratic, $b = 0.03$, $SE_{HC4m} = 0.01$, $t = 2.46$, $p = .015$, effects of in-group identification, and no significant effects of general fandom $b < 0.02$, $p = .42$, injury severity $b < 0.02$, $p = .81$, and pain severity $b = 0.05$, $SE_{HC4m} = 0.07$, $p = .42$. Gender, however, was not significantly associated with gluckschmerz intensity, $b = -0.06$, $SE_{HC4m} = 0.07$, $t = -0.85$, $p = .40$. Model R^2 was .16, $p < 001$.

Mediation analyses, gluckschmerz Multiple mediation analysis on the linear effect of in-group identification on the presence of gluckschmerz in response to the rival player's recovery (controlling for gender, injury severity, and injury painfulness) was performed with perceived in-group loss, outgroup dislike, and outgroup resentment entered as mediators. Feeling that the recovery hurt one's in-group, OR 1.74, 95 % CI (1.41–2.38) and feelings of resentment, OR 1.23, 95 % CI (1.04–3.42), significantly mediated the effect, whereas dislike of the outgroup was not a significant mediator, OR 1.09, 95 % CI (0.96–1.24). There was no significant direct effect of identification, OR 0.94, 95 % CI (0.75–1.16).

Mediation analysis of the log-intensity of gluckschmerz provided a pattern of results very similar to the mediation results for in-group identification's effects on the presence of gluckschmerz. There were significant indirect effects of identification via loss, $b = 0.08$, $SE_{HC3} = 0.02$, 95 % CI (0.05–0.12) and resentment, $b = 0.03$, $SE_{HC3} = 0.01$, 95 % CI (0.010–0.05), but no significant effect via dislike, $b = 0.009$, $SE_{HC3} = 0.01$, 95 % CI (−0.009–0.03), and there was no significant direct effect of identification, $b = -0.03$, $SE_{HC3} = 0.02$, 95 % CI (−0.07 to 0.002).

Discussion

Study 4 affirmed that in-group identification is associated with schadenfreude in response to very severe and painful outgroup member misfortunes, and gluckschmerz in response to the good fortune of recoveries. We were also able to clarify the roles of potential mediators of those

associations. As expected, perceived in-group gain, dislike of the outgroup, and perceptions that the outgroup deserved similar misfortunes played related but distinct roles in explaining the association of in-group identification with schadenfreude in reaction to an outgroup member's injury, whether examining indirect effects on schadenfreude's presence, or its intensity when present. Similarly, perceived in-group loss and resentment of the outgroup helped explain why highly identified fans more often and more intensely experienced gluckschmerz than casual fans after recovery, although significant mediation via dislike was not found. This null finding, however, was likely a consequence of both the single-item measure used and the fact that indirect effects via related constructs perceived loss and resentment were partialled out.[6]

We found that participants attended more to pain information when an injury was minor than when it was serious. Perhaps the great consequences for one's in-group of a rival team member's being out for the season (or longer) worked against their appreciating the pain. After all, severity, generally, seemed to be relatively unimportant in determining the emotional reactions of high-identifying fans, who stand to gain the most psychologically from negative events happening to the outgroup, whether in terms of perceived gain for the in-group, or from feeling that justice is being served to a disliked outgroup that they resent. Likewise, it would seem highly identified in-group members stand to lose more psychologically than more casual fans when an important outgroup member is once again able to contribute to the rival cause.

There are a number of potential explanations for the finding that happiness over the player's pain *per se* did not significantly mediate the relationship between in-group identification and the presence and intensity of schadenfreude. Regardless, one might speculate that in-group identification's sizable positive association with being "pleased but ashamed" ($r = .45$, $p < .01$) hints at social desirability being a potential concern for even highly identified fans. Admitting to happiness over another's pain, especially in response to a life-altering negative event, is socially acceptable under few circumstances. Still, it seems likely that low regard for the outgroup increased happiness over the outgroup member's pain, independent of any consequences for the in-group.[7] In research by Cikara et al. (2011b), very highly identified fans professing hatred for a rival baseball team sometimes expressed a willingness to aggress against avid fans of rival baseball teams. It stands to reason, then, that pain suffered by a member of the outgroup team itself might bring a measure of joy to highly identified fans, independent of other factors.

General discussion

There are a number of conclusions suggested by the pattern of findings across the four studies. First, there seems little question that in-group identification is likely to play a potent role in how people respond to a rival group's outcomes. Indeed, the degree of in-group identification was associated with the emotional reactions to both good and bad things happening to an outgroup. Increasing in-group identification was linked with less normative responses to both misfortunes (schadenfreude) and good fortunes (gluckschmerz). Thus, the present findings provide novel evidence for extending the range of emotional reactions to rivals that appear associated with variations in in-group identification. It was as if the high-identified group member, compared with the low-identified group member, occupied, to a degree, a separate emotional universe when responding to a rival's good and bad outcomes.

A second conclusion is that the emotional reactions of schadenfreude and gluckschmerz appear relatively unaffected by the severity of the initial misfortune. For example, we expected that our manipulation of injury severity in Study 3 (out for season or out for season and NBA career in doubt) would moderate the associations of in-group identification with schadenfreude and gluckschmerz, but the results suggested that the link remains even when a misfortune is potentially very severe (cf. Ben-Ze'ev 1992). We replicated and extended this novel finding in Study 4, where the association was, if anything, even stronger when the outgroup player suffered the extreme personal misfortune of seeing his dream of an NBA career come to an end.[8] This general theme was extended further with the finding that the manipulation of pain also failed to moderate the pattern of effects for identification. These findings for severity and pain are important because they suggest that the emotional life of a highly identified group member (or fan, in this case) is directed by aspects of the situation besides those that usually produce empathy and sympathy.

What are these factors? A third conclusion from our results is that perceived in-group gain, dislike of the

[6] Dislike was a significant mediator in single-mediator models for both the presence of gluckschmerz, OR 1.18, 95 % CI (1.07–1.32), and the log-intensity of gluckschmerz when experienced, $b = 0.04$, $SE = 0.01$, 95 % CI (0.02–0.07).

[7] A modest-but-significant zero-order correlation between in-group identification and happiness over the pain was present, $r = .12$, $p = .048$, $\tau = .10$, $p = .031$, but controlling for gender and general fandom reduced this effect to nonsignificance, $r = .07$, $p = .22$, $\tau = .06$, $p = .13$.

[8] The strength of the associations between in-group identification and schadenfreude and gluckschmerz was descriptively higher among the subset of participants who read about a career-ending injury than for the other participants in Study 4; controlling for gender and general fandom, $r_{\text{schadenfreude}} = .35$ versus .28, $r_{\text{gluckschmerz}} = .38$ versus .34.

outgroup, and perceptions that the outgroup deserved misfortunes appear to play overlapping but distinct roles in explaining why in-group identification is associated with schadenfreude in reaction to an outgroup member's misfortune. Perceived in-group loss, and dislike and resentment of the outgroup, helped explain why in-group identification is associated with negative feelings following a contrasting good fortune. Overall, these results reaffirmed that varied emotions and judgments are likely to play significant roles in schadenfreude by showing that each helps explain in-group identification's influence on reactions to outgroup misfortunes. Further, the conceptual similarities of the mediational findings on gluckschmerz to those for schadenfreude provided evidence that these emotions may have common origins, at least in an inter-group context. Both emotions reflect responses to outgroup events whose significance depends on consequences for the in-group and one's level of in-group identification. Future research should further elucidate linkages between schadenfreude and gluckschmerz, especially in interpersonal contexts (e.g., with in-group peers as targets), and should also examine the roles of other emotions in experiences of gluckschmerz, such as envy (Smith and Kim 2007) and inferiority (Leach and Spears 2008), which have been implicated as causes of schadenfreude.

A number of procedural features of this research are worth emphasizing. We used a range of contexts for collecting participants' responses, from various public places on campus, to classroom settings, to laboratory group sessions. Sometimes, the identification measures were administered at an earlier, separate time and other times right after responding to the article(s). Regardless of setting, care was taken to ensure the anonymity of participants' responses and to enhance the authenticity of these responses. Some of the events were actual and others were constructed to appear actual, but our assessment at the end of each study suggested that few participants perceived any of the events to be false. Thus, the procedures were marked by high mundane realism (in the sense that they involved reading articles about sports, a common activity) and authentic responding, valuable features when studying socially undesirable emotions. These findings are especially valuable in the sense that they replicate and extend previous work involving reactions to simulated events (Cikara et al. 2011b; Cikara and Fiske 2012).

Finally, we obtained similar results for in-group identification despite using several different players across the four studies.[9] Thus, the results militate against alternative explanations for highly identified fans' reactions to outgroup misfortunes or good fortunes being byproducts of negative feelings toward a particular player or of a particular rivalry. Moreover, the studies spanned both substandard and championship years for the University of Kentucky men's basketball team, suggesting that in-group identification's effects on schadenfreude and gluckschmerz are robust to the relative superiority or inferiority of one's in-group over the outgroup in any given season, although relative standing likely does play an important role in such intergroup dynamics (e.g., Cuddy et al. 2007; Fiske et al. 2002; Leach et al. 2003; Leach and Spears 2008). An interesting avenue for further research might be to investigate the relative role of negational identification (i.e., defining one's social group in terms of who they are not—"We are *not* Duke") in driving socially-undesirable reactions to events such as misfortunes suffered by outgroups when one's group is relatively inferior versus superior in standing to particular outgroups ("We are worse than Duke") and more generally ("We are a top team"). Negational categorization increases outgroup derogation (Zhong et al. 2008), so it is possible that schadenfreude is especially sweet, and gluckschmerz especially bitter, when emphasis is placed on defining the in-group in terms of who they are not, rather than who they are.

Limitations

Although there is little reason to suspect that University of Kentucky students, or Kentucky basketball fans in general, react very differently to events relevant to in-group/outgroup fortunes than others (especially to sports-related events), it should be acknowledged that identification with the University of Kentucky men's basketball team was the only social identity we tested in these studies. Thus, despite the other features of our methods that tended to enhance the generalizability of our findings, it is still possible that idiosyncratic characteristics of our participants led to some of our results. Also, because we could not experimentally manipulate the broad array of in-group identification levels we observed in the studies, from non-fan to fanatical, one cannot conclusively infer that in-group identification caused observed identification-related differences, despite having controlled for the potential confound general fandom, and, in Studies 3 and 4, participant gender as well.

[9] In another study, we replicated the basic finding for in-group identification using a player for a different rival team, the University of North Carolina (UNC). (Kentucky and UNC are ranked 1 and 3 in total number of all time victories.) Ninety participants read an article indicating that Kendall Marshall of UNC's men's basketball team had successful surgery for his wrist, but would most likely be out for the rest of the NCAA tournament. Controlling for sport fandom, in-group identification was significantly related to schadenfreude in reaction to reading about Marshall's wrist injury, $b = 0.24$, $SE = 0.10$, $t = 2.35$, $p = .021$; in single mediation analyses, perceived in-group gain, perceptions of deservedness, and dislike of UNC mediated this effect. Gain and deservedness were significant mediators in the multiple mediation analysis with all three potential mediators.

We utilized self-reports (i.e., paper-and-pen questionnaires), which are generally more vulnerable to social desirability biases than physiological or implicit measures. Nonetheless, these biases should act against our findings linking in-group identification with schadenfreude and gluckschmerz, as both emotions are socially undesirable and unlikely to be publicly expressed in most contexts (e.g., Smith et al. 2009), especially when they represent inversions of normative responses to painful injuries and the like. Modeling the presence/absence of schadenfreude and gluckschmerz separately from their intensity when present in Study 4 suggested that social desirability might have been an especially strong concern for participants when deciding whether to report experiencing even a small amount of either of these emotions, as reading about a very painful injury lowered the likelihood of reporting any schadenfreude and gluckschmerz upon recovery but had no significant effect on reports of these emotions' intensity. Moreover, consistently greater reported gluckschmerz over recoveries, and the lack of gender effects on emotional reactions to these recoveries, suggests that people, perhaps especially women, are understandably more reluctant to express joy over misfortunes than they are to express displeasure over good fortunes. That we found robust associations may well have been due to the privacy we assured participants they would have as they completed the confidential questionnaires. Demand characteristics were of relatively little concern because the identity measures were sometimes included in mass-testing well before the main study. It should also be emphasized again that an advantage of our methodology was that many sports fans read online and newspaper stories as a primary, if not predominant, source of information on their favorite teams.[10]

Conclusions

Four studies reaffirmed the role of identity in reactions to intergroup events, whether minor or major, positive or negative. We replicated and extended previous research on schadenfreude, its antecedents, and processes through which it may arise. We found these results across multiple years, rivalries, and types of misfortunes, and used a number of techniques to ensure valid statistical inferences were made. Perhaps more importantly, we provided a novel examination of how in-group identification is associated with the pain over another person or group's good fortune, or gluckschmerz. We consistently found that gluckschmerz is related to schadenfreude, despite the pleasure of the former and the unpleasantness of the latter. Notably, we also found that the processes through which in-group identity may exert its effects on reactions to outgroup good fortune are tightly related to those influencing reactions to outgroup misfortune. Outgroup dislike, the perceived deservedness of similar misfortunes for the outgroup (or resentment over a beneficial recovery), and in-group gain (or in-group loss because of a competitor's recovery) each played recurring roles in experiences of schadenfreude and gluckschmerz. Indeed, it may be that people experience gluckschmerz more frequently than schadenfreude, to the extent that rivals more often experience public successes than failures. Regardless, incorporating the study of such reactions to others' good fortunes will expand our understanding of social emotions.

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[10] In light of the close logical and empirical links between schadenfreude and gluckschmerz, one might question whether gluckschmerz occurs when one has not previously learned of a misfortune suffered by the other. A "satisfying" misfortune may set up a necessary contrast through a reversal of fortunes. To address this possibility, we conducted a follow-up to Study 3 in which we found that gluckschmerz can occur in the absence of a counter-expectancy (in this case, the belief that an outgroup player would remain injured). Participants read only the article about Rivers' recovery. Controlling for general sport fandom, in-group identification was positively related to gluckschmerz ($M = 1.49$, $SD = 1.62$), $b = 0.36$, $SE = 0.12$, $t = 3.02$, $p = .004$. Gluckschmerz apparently does not require previous schadenfreude, nor is the previous experience of implied in-group gain due to an outgroup misfortune necessary to feel a sense of in-group loss when the outgroup benefits from a member's renewed ability to actively contribute.

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