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RESEARCH ARTICLE

You Can't Root for Both Teams!: Convergent Evidence for the Unidirectionality of Group Loyalty

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Abstract
Four studies tested the existence of a social norm that one cannot simultaneously support two competing groups or teams. Our evolved coalitional psychology should be sensitive to individuals expressing mixed loyalties between rivals, as they represent substantial threats for defection. Study 1 manipulated confederate attire and demonstrated that public displays of mixed loyalty provoked more attention and reactions than displays of consistent loyalty ($n = 1327$). Informants ($n = 31$) in the same population interviewed for study 2 agreed with the norm and cited the norm violation as the cause of reactions. Study 3 provided a more systematic and comprehensive assessment of affective and cognitive reactions to mixed and matching loyalty displays with an on-line survey of participants ($n = 325$) in the respective states of the rival universities. Study 4 examined naturalistic reactions ($n = 318$) to social media advertisements suggesting mixed loyalty to the two rival teams featured in the first three studies. These diverse methodologies provided convergent confirmatory evidence for the proposed social norm.

Keywords Teams · Intergroup perception · Evolutionary psychology · Loyalty · Observational methods

We hypothesize the existence of a social norm, emerging from evolved coalitional psychology, that true loyalty is limited to one group in a set of competitors. Mixed loyalties represent a substantial threat, as seen in the concluding battle of the English Civil War ("Wars of the Roses") between the Houses of Lancaster and York. The Stanley family had a mixture of loyalties between these other noble Houses and were skillful in strategically switching their favoritism. William Stanley's soldiers entered the battle and attacked King Richard just as he was within striking range of his adversary, Henry Tudor. The Stanley's intervention at the Battle of Bosworth Field had a tremendous impact on the history of the English-speaking world. The grateful King Henry bestowed great rewards on the Stanley family, yet this was a treacherous defection from the perspective of King Richard and his allies. Four studies test reactions to displays of mixed loyalties between rivals, providing convergent evidence from quantitative and qualitative analyses of survey responses, qualitative analyses of face-to-face interviews, naturalistic observations of behavior on public social media, and observations of reactions to experimental manipulations in a naturalistic setting.

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Evolved Coalitional Psychology

In-group loyalty and intergroup competition are important themes of behavior in humans and other social species (see van der Dennen 2002). Intergroup encounters are often hostile in humanity's closest living relatives, Chimpanzees, who are highly territorial (Alexander 1979; Boehm 1999; Wrangham and Peterson 1996). Male chimpanzees perform patrols of territorial boundaries and raid the territories of other groups, with sometimes lethal outcomes (Goodall 1990). Alexander (1979) proposed that competition with other hominids, both

within and between groups, became a principal concern and the most potent selection force once our hominid ancestors achieved ecological dominance over other species. There is considerable evidence supporting this proposal, including mass graves of bodies exhibiting violent injuries dating from as early as 200,000 years ago (Keeley 1996).

Social psychologists have long recognized the importance of group loyalty as a fundamental aspect and product of socialization (e.g., Bogardus 1924) and coalitional biases are now extensively documented (see Ruffle and Sosis 2006). The differentiation of mutually exclusive groups is fundamental to coalitional psychology. Even superficial criteria can lead to group differentiation, deep emotional attachments to in-groups, and discrimination against out-groups (Brewer 1979; Ostrom and Sedikides 1992; Sherif 1966; Tajfel and Turner 1979; Wetherell 1982). Coalitional alliances facilitate cooperation, even when individual identities are unknown (Ruffle and Sosis 2006), increase the costs individuals are willing to incur to punish defection (Bernhard et al. 2006), and promote the acquisition of resources, territories, and mates (Kenrick et al. 2003), facilitating reproductive success.

Our evolved psychology is likely to include coalition-detection mechanisms sensitive to indicators of alliances (Kurzban and Leary 2001). Clothing signaling allegiance may act as a heuristic cue, activating coalitional psychology for the person wearing the items as well as those observing the display (Kurzban and Leary 2001; Schaller et al. 2003). Clothing is an essential symbolic social tool, conveying information about the individual's affiliations and preferences and influencing judgments by others (Piacentini and Mailer 2004). Much of athletic team loyalty is communicated non-verbally though apparel and paraphilia displaying university or team names and logos (End et al. 2002; Lindquist 2006). Athletic teams build intense loyalties in their players with a series of rituals, beginning with a staged public signing event where players symbolically don the team's uniform or other team-branded apparel (Trice and Beyer 1984). Displays of school-identifying apparel increase after a football victory (Cialdini et al. 1976). Individuals will be likely to join a team when team competition resembles characteristics of warfare, including visual symbols of group identification and benefits following team success (Winegard and Deaner 2010).

Team Sports and Evolved Coalitional Psychology

Team sports are an excellent context for examining evolved coalitional psychology and behavior, as they are prevalent cross-culturally and draw substantial attention from considerable proportions of populations. Humans are the only species that plays in teams (Symons 1978). Team sports feature multiple aspects of in-group loyalty and intergroup competition, phenomena influenced by our evolved coalitional psychology (Kruger et al. 2007; van der Dennen 2002; Winegard and Deaner 2010). Interest in following sports teams and behaviors such as expressing commitment to team goals, providing material support, displaying team symbols, and monitoring team competitions may arise from psychological adaptations establishing and maintaining coalitions in small-scale warfare (Winegard and Deaner 2010). Team sports contain activities similar to those of territorial raiding (Scalise Sugiyama et al. 2016; Winegard and Deaner 2010), and men in foraging tribes utilize motor skills involved in actual forager warfare during team games (Scalise Sugiyama et al. 2016). Manson and Wrangham (1991) proposed that men have a set of cognitive adaptations specific to coalitional intergroup aggression. The similarities between competitive sports and intergroup warfare have long been evident across several cultures, including Classical Greece, Han dynasty China, the ancient societies of Japan and Korea (Crowther 2007), and ancient Mesoamerica (Wilkerson 1991). The conceptual associations are evidence by the prevalence of both sports metaphors in warfare and war metaphors in sports (Jansen and Sabo 1994).

Unidirectional Loyalty

Individuals are typically loyal to only one team in set of competitors, rather than switching loyalties depending on wins and losses (Richardson and O'Dwyer 2003). In a previous observational study of thousands of individuals, no one simultaneously wore apparel from two competing university teams, or even displayed combinations of merchandise from any two colleges or universities (Kruger & Kruger 2015). Individuals who express or maintain affiliations with multiple teams or groups within a competitive set may be seen as a threat by others. These individuals may pose a risk for defection in active conflict, which may be especially dangerous due to familiarity with group characteristics, access to privileged information, and access to protected areas. Although some individuals may feel affinities towards multiple competing teams (e.g., those who have studied or worked at multiple colleges or universities), we hypothesize existence of a social norm that one cannot simultaneously support two competing groups or teams as enforcement of this norm may reduce the risk of defection.

Sex Differences in Between-Group Competition and Coalitional Psychology

Men may be more sensitive to coalitional dynamics than women, as intergroup competition affected men's ability to gain social status, territory, and mates, with substantial consequences for their reproductive success (Van Vugt et al. 2007). In other social primates, males are primarily involved in coalition formation and territorial defense (Boehm 1999;

Wrangham and Peterson 1996). In contemporary humans, male coalitions commit almost all acts of intergroup aggression (Atran 2003; Goldstein 2003). Tribal-type affiliations are fundamental to men's self-concepts and decision making, whereas interpersonal relationships are more central to women's self-concepts and decision making (Baumeister and Sommer 1997; Van Vugt 2009). Men are more likely than women to exhibit risky behavior related to between-group competition (Kruger et al. 2007; Pemberton et al. 1996; Wang et al. 2009). Both warriors in contemporary foraging populations (Chagnon 1988) and gang members in artificial fertility populations in the urban United States (Palmer and Tilley 1995) have higher reproductive success than men who are not active in violent non-coalitions. Men also have greater interests in team sports than women, both as participants and spectators (for a review, see: Deaner et al. 2016). We expect that men will be more sensitive to expressions of coalitional allegiance and mixed loyalties between rivals than women. Post hoc analyses test for differences in reactions based on subject and participant gender.

Overview of the Current Research

This manuscript describes four pre-registered studies with complementary methodologies testing for the existence of a social norm that an individual can only be loyal to one group in a set of rival competitors. Individuals expressing mixed or conflicting affiliations may be considered a potential defector in competitive situations. "Rival" derives from the Latin word "rivalis," someone on the other side of the river, who may be using the same stream of water. In 1835, the U.S. State of Ohio and the Michigan Territory mustered militias on opposite sides of the Maumee River in the largest U.S. inter-state conflict prior to the Civil War, known as the "Toledo War." The contested area known as the Toledo Strip was north of the boundary line designated by the Northwest Ordinance of 1787, yet the drafters of the 1803 Ohio state constitution added a special provision claiming the area.

This territorial dispute is recapitulated in the "Border Battle" between the football teams of the Ohio State University and the University of Michigan (Emmanuel 2004). The teams have been each other's chief rivals since at least 1918 (Lindquist 2006). Both the fierce rivalry between the university football teams and the divided team loyalties among local residents are significant features Toledo's culture. Merchandise featuring both universities is widely available in the Toledo area, general merchandise stores typically display OSU and UM items adjacently and in equal proportions. There are also stores featuring the rivalry as a theme, such as the Buckeye Wolverine Shop, which display team merchandise in segregated sections. Both the Michigan Wolverines "Block M" and Ohio State Buckeyes "O" logos are easily seen and recognized. The current studies use the context of the University of Michigan (UM) – Ohio State University (OSU) rivalry and studies 1 and 2 were conducted in Toledo.

Study 1 combined experimental manipulations of loyalty displays with observations of reactions in a naturalistic public setting. The ethological approach of naturalistic observations enhances the understanding of human behavior (see Eibl-Eibesfeldt 1989). Study 2 utilized brief informant interviews to verify the interpretation of the results of study 1. Study 3 was an on-line survey of participants in the respective states of the rival universities that enabled more comprehensive documentation of affective and cognitive reactions to displays of mixed and matching loyalty. Study 4 examined naturalistic reactions (Facebook comments) to social media advertisements suggesting mixed loyalty to the two rival teams featured in the first three studies. All studies were reviewed by the University of Michigan's Institutional prior to data collection.

Study 1

Hypothesis Displays of mixed loyalty among competitors may be counter-intuitive as they would violate a social norm that one can only be affiliated with one team in a set.

Thus, we predicted that an individual wearing merchandise featuring two competing teams would provoke observable reactions such as staring, double takes, and comments, at higher rates than displays of consistent loyalty to one team. This prediction was tested in a community where allegiance to the teams is divided among residents (Emmanuel 2004; Kruger & Kruger 2015). The background, hypotheses, method, and analyses for study 1 were pre-registered prior to data collection with the Open Science Framework (https://osf.io/rcdgh/).

Participants and Procedure

The research team conducted 12 observations at a popular indoor shopping mall during the Fall 2015 collegiate football season. The Franklin Park Mall is within the City of Toledo and is accessible by public transportation, enabling a diverse population of visitors. Observations occurred on weekend afternoons when both teams were playing, ending at least an hour before games were held. One male confederate walked one circuit of the mall's open corridors carrying a generic brown shopping bag and wearing merchandise displaying the universities' names on a shirt and logos on a hat in traditional colors. Across observations, the confederate wore each combination of apparel one fourth of the time (matching OSU, matching UM, UM hat and OSU shirt, OSU hat and UM shirt). Conditions and order were randomly assigned with a coin toss, with one mixed condition and one matched condition on the same day. Other research team members followed

3–5 m behind and videotaped with an inconspicuous camera to facilitate coding of behaviors from the recorded footage. A Flip Ultra HD 3 Camcorder was concealed in a decorative paper shopping bag with an abstract decorative pattern. No words or symbols were visible on the bag and research team members noted that no other individuals noticed the bag and/or camera. A small hole was cut in the bag to expose the camera lens, the camera positioned at knee height and the bag was weighted so that the camera view angled upwards to record the confederate and individuals passing by in the mall's public corridors. Equipment trials verified that all individuals walking past the confederate within the mall corridor would be visible in at least some frames. Research team members did not initiate interactions with other individuals. Observers were aware of the experimental conditions and interest in university-related merchandise but were not informed of the direction of the predicted effect until after data collection was complete.

Measures

The research team developed an ethogram of reactions to unusual behavior by other individuals. Two observers in each session independently coded subject behaviors using Microsoft™ Excel spreadsheets. Coding research team members counted the total number of individuals and indicated whether (code = 1) or not (code = 0) each individual made the following responses: 1. Glance—look at the confederate for one second or less; 2. Stare—look at the confederate for more than one second; 3. Double take (look at the confederate, look away, then look back at the confederate); 4. Direct attention of companions to the confederate non-verbally; 5. Verbal comment to companions; 6. Verbal comment to confederate; 7. Non-verbal gesture directed at the confederate. Scores were summed for each individual to create the outcome variable. Coders noted discrepancies in codes and reviewed video footage to reach agreement on codes. All individuals whose gaze direction could be determined (i.e., looking at the confederate or not) were included as subjects. We ran an independent-samples *t* test comparing mixed loyalty and matching loyalty conditions on total reaction scores and calculated effect size and observed power.

Results

There were 1327 individuals observed and coded, 768 men, 533 women, and 26 individuals whose gender was not coded. The camera view was obscured during one OSU shirt/UM hat condition observation and part of the matching OSU condition observation conducted on the same day. Thus, there were 431 observations in the matching UM condition (32.5%), 394 in the UM shirt, OSU hat condition (29.7%), 320 in the matching OSU condition (24.1%), and 182 in the OSU shirt, UM hat condition (13.7%). There was a moderately large effect supporting the hypothesis that observable reactions would be higher in the mixed loyalty condition than the matching loyalty condition, $t(1325) = 3.34$, $p < .001$, $d = .74$, observed power ($1\text{-}\beta$) = .915 (see Fig. 1). Overall, reactions were observed in 15.3% of individuals in the mixed loyalty condition and 10.1% of individuals in the matching loyalty condition. For the mixed loyalty condition, there were 67 glances, 26 stares, 4 double takes, 3 directions of companions' attention, one verbal comment, and one non-verbal gesture. For the matching loyalty condition, there were 62 glances, 14 stares, one double take, one direction of companions' attention, no verbal comments, and one non-verbal gesture. The rate of reactions for behaviors beyond a brief glance was about three times (2.7) higher in the mixed loyalty condition than in the matching loyalty condition. Post hoc analyses revealed that men were significantly more likely to react (15.4%) to the confederate (in any condition) than women (10.1%). There was a main effect for participant gender, $F(1,1297) = 10.82$, $p < .001$, in overall reaction scores. The interaction between participant gender and experimental condition was not significant, $F(1,1297) = 0.75$, $p = .387$.

Discussion

Displaying mixed loyalty between rivals drew attention and provoked reactions at higher rates than displaying matching loyalty, confirming our prediction. These results suggest that displaying loyalties mixed among competing groups is counter-intuitive and may violate a social norm that one can only be truly affiliated with one group or team in a set of competitors. Observers noted that the verbal comment directly referenced the inconsistent allegiance, e.g., "Hey, that guy is wearing a U of M shirt and an Ohio State hat!," suggesting that subjects were reacting to a violation of the proposed social norm.

Observations during consistent displays of loyalty were not without incident. For example, during an observation when the confederate was wearing matching University of Michigan items, a man wearing an Ohio State University shirt noticed him, put on an OSU hat, and followed the confederate at close range for several minutes. Team members noted considerable merchandise featuring each university in the field site, as well as items portraying the rivalry. This athletic rivalry and division of team loyalty appears to be a significant feature of the local culture. Hence, even consistent displays of team loyalty may attract attention from potential allies and adversaries.

Study 2

Although verbalizations documented in study 1 supported the notion that reactions were due to a violation of the proposed

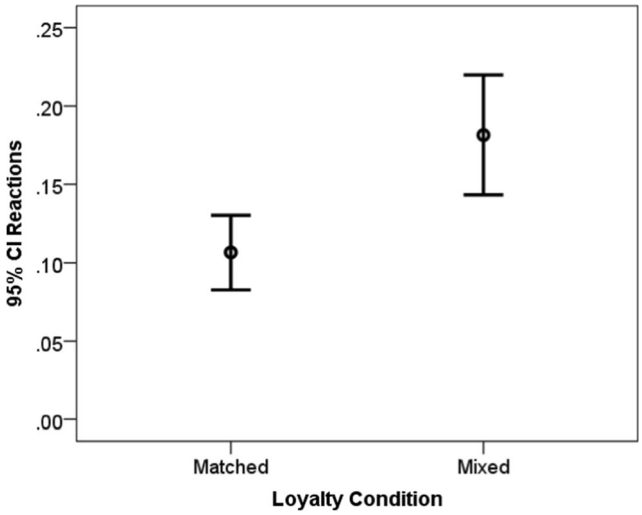

Fig. 1 95% confidence intervals for total reaction scores across loyalty conditions

social norm, the majority of documented reactions were non-verbal. Study 2 was designed to demonstrate that the cause of reactions was the mixed allegiance display. Toledo area residents were presented with pictures of the confederate wearing each combination of outfit and their reactions were documented. When viewing the confederate wearing consistent outfits (matching condition), participants were expected to make general expressions of support for their favored team (e.g., cheers, team slogans, etc.) and expressions of dislike (boos, etc.) for the rival team. Reactions to the mixed conditions are expected to involve more negative affect (disgust, anger, distress, etc.) than reactions to the matching conditions. Participants are also expected to exhibit physical reactions more so in the mixed conditions compared to the matching conditions: leaning closer to the phone, squinting, and distancing behaviors such as holding one's hand up, stepping back, etc. The background, hypotheses, method, and analyses for study 2 were pre-registered prior to data collection with the Open Science Framework (https://osf.io/z2xye/).

Hypotheses Compared to reactions to the matching loyalty displays, reactions to the mixed loyalty displays are expected to demonstrate higher rates of: Statements regarding inappropriate or confusing behavior (H1); Negative affect (disgust, anger, distress, etc.; H2); Physical reactions (verification and distancing behaviors; H3). The majority of participants are expected to explicitly express a sentiment consistent with a social norm that one cannot simultaneously be a supporter of two competing groups or teams (H4).

Participants and Procedure

The researcher recruited 31 Toledo area residents (18 men, 13 women) during casual conversations in public locations. A minimum sample of 30 individuals was expected to achieve adequate statistical power, $(1\text{-}\beta) = .80$, in planned non-parametric comparisons with two observations for each individual in each category (mixed vs. matched loyalty). A diverse sample of participants was recruited from locations including a fundraiser for local non-profit organizations, two Middle-Eastern restaurants, an inner-city soul food restaurant, an urban hipster bar, a historic neighborhood district, furniture moving personnel, a local university, a customer center for household cable service, and a car rental office. Locations with a sports-related context (sporting events, sports bars, etc.) were intentionally avoided to ensure a strong test of the hypothesis.

The researcher engaged in verbal discussion with potential participants. After establishing a conversation and screening for local residency, verbal consent was obtained for the study by asking, "I am doing a little research project, would you like to hear about it?" After an affirmative response, the researcher asked participants which of the rival teams they favored, then showed participants pictures of the confederate from study 1 on a smartphone. The photographs were virtually identical, with an identical background and neutral facial expression, depicting all four combinations of apparel.

The researcher asked, "What do you think about this?" before presenting each photo, first showing the pictures of matching loyalty displays and then showing the pictures of mixed loyalty displays. The researcher showed the matching favored team image first for 29 of 31 subjects as planned; however, two subjects were accidentally shown the matching rival team image first. The researcher sometimes used non-leading prompts (e.g., Why?, Why not?, Why would you say that?) to clarify participants' thoughts and reactions. These responses were used to test H1. After all responses were recorded, the researcher debriefed participants and revealed that the project's goal was to determine whether or not "when there are two competing groups or teams, you can be loyal to only one of the teams." The researcher documented whether or not the participant agreed with this proposed social norm to assess H4. The researcher took live notes, rather than digitally recording interactions, and was not able to simultaneously record verbal statements (H1), emotional responses (H2), and physical reactions (H3), so verbal statements were prioritized and H2 and H3 were deferred.

Analyses

Two study 1 research team members independently coded participants' statements for remarks regarding inappropriate or confusing behavior. Responses to the four images were combined and sorted in a randomized order so that coders were blind to condition. The proportions of responses matching and not matching coding criteria for statements regarding inappropriate or confusing behavior (H1) and

agreeing or disagreeing with the social norm proposed by the central study hypothesis that one cannot simultaneously be a supporter of two competing groups or teams (H4) were compared with chi-square tests.

Results

The categorizations of the two coders matched for over 95% of cases. Coders reached agreement on the discrepant cases. Supporting H1, there were 43 responses to the 62 mixed loyalty images (69%) coded as indicating inappropriate or confusing behavior and six responses to the 62 matching loyalty images (10%) coded as indicating inappropriate or confusing behavior and $\chi^2_{(1)} = 46.12$, $p < .001$. Thirty of 31 participants expressed agreement with the central study hypothesis, supporting H4, $\chi^2_{(1)} = 25.32$, $p < .001$.

Discussion

Verbal reactions to mixed and matching loyalty displays and agreement with the proposed social norm demonstrated support for the central hypothesis. Participants responses to mixed loyalty images included surprise, confusion, and anger (e.g., "I feel like I want to punch him"). All statements for matching loyalty displays categorized as indicating inappropriate or confusing behavior were responses to the second matching image presented. Some of these participants explicitly noted that their reaction was in regard to a perceived switch in loyalty (e.g., "That's just wrong. [Why?] The same guy was just wearing U of M."). Although the matching loyalty displays were presented first, all reactions to the mixed outfit pictures supporting the hypothesis focused on the duality of loyalty, rather than a perceived change in loyalty. Most (5/7) respondents at the urban hipster bar expressed that they were not a fan of either team or did not care, including the only person who did not express agreement with the central study hypothesis ("Don't care."). It is possible that this setting influenced results, either by selecting for individuals who were less interested in spectator sports or creating expectations for lower interest. Although participants were interviewed separately and independently, they were within visible range of their companions. It is notable that although these participants presented a blasé attitude during the initial portions of the conversation, the first picture of a mixed loyalty display appeared to generate interest in four of the five individuals, who responded as expected (e.g., "Ah! Confusion," "Wow!," "He is in big trouble!").

Study 3

Study 3 was conducted in part to address predictions in study 2 that were deferred due to methodological limitations. We designed an on-line survey to systematically assess affective and cognitive components of reactions to mixed and matching loyalty displays with participants from the home states of the two universities. The survey adapted extensively validated items for quantitative analyses. Participants indicated their reactions to mixed and matching loyalty display images similar to those used in study 2 with items representing basic emotional reactions (Ekman 1992). These items assessed the presence of emotional responses predicted in H2 of study 2, as well as "confusion" indicating inappropriate or confusing behavior (re: H1 in study 2). The survey included an item assessing agreement or disagreement with the social norm proposed in the central project hypothesis, that one cannot simultaneously be a supporter of two competing groups or teams, similar to the verbal question testing H4 in study 2. The questionnaire included open-ended comments to enable qualitative analyses of participants' explanations for their reactions immediately following the emotional reaction items and before the explicit description of the proposed social norm, to assess spontaneous expression of ideas consistent with the proposed social norm.

Additional items were created based on a validated pictorial measure of interpersonal closeness (Aron et al. 1992). The concept of self-other overlap, or "oneness," is the experience of overlap between oneself and another in a close relationship as described by William James, Carl Jung, Abraham Maslow, and more recent social cognition researchers (Aron et al. 1992). Aron et al. (1992) developed the single item, pictographic Inclusion of Other in Self (IOS) scale, which exhibited convergent validity with longer relationship closeness measures, discriminant validity with measures of other constructs, and test-retest reliability. This measure of interpersonal interconnectedness was adapted to assess participants' identification with the rival universities and their conceptualization of the university teams' relationship with each other. Participants could indicate relationships ranging from complete overlap between entities to complete separation and distancing between entities. The background, hypotheses, method, and analyses for study 3 were pre-registered prior to data collection with the Open Science Framework (https://osf.io/yvej7/).

Hypotheses H1: Participants who indicate a high degree of self-other overlap with one university team will indicate a high degree of separation from the other university team. H2: Participants' ratings of their reactions to the mixed loyalty images will differ from their ratings of their reactions to the matching loyalty images for both their favored team and the rival team. Ratings for anger, confusion, disgust, and surprise will be highest for the mixed images. Ratings for enjoyment and pride will be highest for the matching loyalty image featuring their favored team. H3: Participants' conceptualizations of the university teams will tend to demonstrate a high degree of separation from each other. H4: Participants' ratings of the

social norm proposed by the central project hypothesis, that one can be loyal to only one team among two competing groups or teams, will be significantly biased towards agreement. H5: Participants' open-ended responses will provide evidence for agreement with the central project hypothesis regarding unilateral loyalty. Some participants may explicitly express that it is inappropriate to simultaneously wear clothing featuring two competing teams, that one cannot simultaneously be a fan of or loyal to both teams, or that one has to choose sides in a competition. We expected to identify at least four times as many participant comments agreeing with the proposed social norm as those disagreeing with the proposed social norm.

Participants and Procedure

Undergraduates ($N = 325$, M age = 19, SD age = 2, 67% female) enrolled in large public universities in Michigan (81%) and Ohio (19%) completed anonymous on-line surveys at their convenience. Michigan participants were recruited from the Introductory Psychology Subject Pool, these participants received credit towards their course requirements. Ohio participants were volunteers from Psychology courses and were not compensated. The sample size was determined to enable adequate power (1-$\beta = .80$) to identify medium sized effects ($d \geq .50$) in planned between-subjects comparisons and effects intermediate between small and medium in size ($d > .31$) in planned within-subjects comparisons.

Materials

We generated a series of items based on the Inclusion of Other in Self (IOS) scale (Aron et al. 1992) to test H1. For the first set of items, the item instructions read "Please select the picture that best describes your relationship." Participants selected one of eleven images with a circle labeled "You" and a circular image of a university's logo (Block M for UM; Buckeye O for OSU). Although the usefulness of IOS scale has been demonstrated, there two concerns with its properties. One concern was that the size of the circles are not constant (Aron et al. 1992, p. 597). This introduces a second dimension to the scale, in addition to the degree of overlap. In the modified IOS scale, the size of the circles remained constant across the range of overlap/separation. The other concern was that although the circles range from near complete overlap to adjacent circles with no overlap, there was no option where the circles become separate from each other. This may limit the range of responses. The modified IOS scale included equal intervals of overlap and separation, reaching one diameter of separation between the circles. The maximum degree of separation was equivalent to the maximum degree of overlap. Thus, response options ranged from one diameter (100%) separation between images to complete (100%) overlap of images, approaching each other and eventually merging in 20% image diameter intervals.

Because several participants remarked that the confederate in study 2 images looked sad or insecure (across experimental conditions), we generated an equivalent set of pictures with a second male confederate. Each image was paired with a matrix of basic emotional reactions (Ekman 1992) and also "confusion" on a separate survey page, testing H2. Participants rated each reaction on a 0–100 sliding scale, initially set at 50. The item stem read "Please rate how this picture makes you feel... (0 = as little as possible, 100 = as much as possible)," included ratings for Anger, Confusion, Disgust, Enjoyment, Fear, Pride, Sadness, and Surprise. Participants could move the scale's sliding indicator until they felt it accurately represented their level of experience for each emotional reaction, the values indicated were displayed. At the end of each page, an open-ended item "Why do you feel this way?" generated feedback to test H5.

Another IOS-based item with the scale properties described above was developed to test H3, the item instructions read "Please select the picture that best describes the relationship," and the logo images for both teams (modified to 50% transparency) were used as stimuli. The item "Please indicate how strongly you agree or disagree with the following statement: When there are two competing groups or teams, you can be loyal to only one of the teams" tested H4. Participants selected one option on a fully labeled seven-point scale ranging from "Disagree Strongly" to "Agree Strongly."

Procedure

Participants first rated the IOS-based items indicating the degree of separation or overlap between themselves and each university team logo, on separate pages. Item order was randomized by participants' birth month. Participants next rated reactions to confederate images, image condition and order were randomized by participants' birth month. Each participant rated one matching loyalty and one mixed loyalty image. For some participants, matching loyalty images were for their favored team, for other participants matching loyalty images were for the rival team. Team preferences were identified after data collection by examining responses to the initial IOS-based items. Participants then rated the IOS-based item with both university team logo images. Finally, participants rated the item directly assessing agreement/disagreement with the central project hypothesis.

Analyses H1 was tested by examining the matrix of responses for the initial IOS-based items. For those indicating a high degree of identification with one team (60–100% diameter overlap), the number of participants indicating high (60–100% diameter) separation and the number of participants

indicating moderate (20% diameter) separation from the other team to 100% overlap with the other team were calculated. These proportions were compared with a chi-square test. A one-sample *t* test with the middle response (option 6, adjacent images with 0% separation and 0% overlap) as the test value also examined these responses.

Confederate image conditions (matching favored team, matching rival team, and mixed loyalty) were classified based on fan preferences expressed in the initial IOS-based items. Participants with equivalent scores on these items were excluded from analyses testing H2. H2 was tested with ANOVAs for each of the reaction ratings. Between-subjects comparisons were conducted for both sets of images, including the Tukey-b multiple comparison procedure. The data were restructured to enable within-subjects comparisons of matching favored team vs. mixed loyalty and matching rival team vs. mixed loyalty. H3 was tested with a one-sample *t* test with the middle response (adjacent images with 0% separation and 0% overlap) as the test value for the IOS-based university logos item. H4 was tested with a one-sample *t* test with the middle (neutral) response as the test value for responses to the central project hypothesis item. Effect sizes, 95% confidence intervals, and observed power were calculated when possible.

Participants' open-ended comments for the mixed outfit images were coded into agreement, disagreement, neutral, and ambiguous categories regarding the central hypothesis to test H5. Agreement responses explicitly expressed that it is inappropriate to simultaneously wear clothing featuring two competing teams, that one cannot simultaneously be a fan of or loyal to both teams, or that one has to choose sides in a competition (e.g., "I don't think it's possible to be both an Ohio State and a Michigan fan considering the history between the two schools"; "you can't do both!!!!!!! no loyalty"). Disagreement responses supported the confederate's choice of attire and/or disagreed with the proposed social norm (e.g., "It's surprising to see someone wearing both UM and OSU gear, but it's really not that big of a deal. He has a right to like what he likes"; "people can express themselves however they want."). Neutral statements expressed neutrality towards the proposed social norm or a lack of interest (e.g., "An odd combination for sure but hey, who cares"; "I don't really care about sport rivalries"). Statements that were not directly addressing the central project hypothesis ("No one should ever wear an Ohio state shirt"; "Proud that Michigan is the better school") and statements outside of the context of the research topic (e.g., "What is he doing with his life?") were classified as ambiguous. Statements expressing confusion without specifically mentioning the rivalry (e.g., "It is just confusing"; "What did he mean by this") were noted and were ultimately classified as ambiguous to increase confidence in the conclusions regarding these items.

Results

H1 was supported, $\chi^2_{(1)} = 13.38$, $p < .001$, of 218 participants who highly identified (indicated a high degree of self-other overlap) with one team, 136 (62%) had high separation from the rival team. Ratings for the rival team were significantly biased towards separation, $t_{(213)} = 7.25$, $p < .001$, $d = 0.50$, 95% CI difference: 1.40–2.45, observed power (1-β) = 0.95.

H2 was supported for 22 of 30 predicted relationships (see Tables 1 and 2). For between-subject comparisons of the first confederate image presented, participants' Enjoyment and Pride reactions were higher for the matching favored image than the matching rival image ($d = 1.24$, 1-$\beta = .99$; $d = 1.68$, 1-$\beta = .99$) and the mixed image ($d = .84$, 1-$\beta = .99$; $d = 1.77$, 1-$\beta = .99$). Reactions of Confusion and Surprise were higher for the mixed image than for the rival image ($d = .89$, 1-$\beta = .99$; $d = 0.77$, 1-$\beta = .99$) and favored image ($d = 1.08$, 1-$\beta = .99$; $d = 1.19$, 1-$\beta = .99$). Reactions of Anger and Disgust were higher for the mixed image than for the favored image ($d = 1.26$, 1-$\beta = .99$; $d = 1.28$, 1-$\beta = .99$), but did not differ between the mixed image and rival image ($d = 0.01$, 1-$\beta = .03$; $d = 0.10$, 1-$\beta = .12$).

There was a similar pattern of results for between-subject comparisons for the second confederate image presented, except for Disgust (see Table 1). Participants' Enjoyment and Pride reactions were higher for the matching favored image than the matching rival image ($d = 1.71$, 1-$\beta = .99$; $d = 1.81$, 1-$\beta = .99$) and the mixed image ($d = 1.40$, 1-$\beta = .99$; $d = 1.77$, 1-$\beta = .99$). Reactions of Confusion and Surprise were higher for the mixed image than for the rival image (1.18, 1-$\beta = .99$; $d = 1.22$, 1-$\beta = .99$) and favored image ($d = 1.76$, 1-$\beta = .99$; $d = 1.50$, 1-$\beta = .99$). Reactions of Anger and Disgust were higher for the mixed image than for the favored image ($d = 1.21$, 1-$\beta = .99$; $d = 1.11$, 1-$\beta = .99$), Anger did not differ between the mixed image and rival image ($d = 0.01$, 1-$\beta = .03$; $d = 0.10$, 1-$\beta = .12$), Disgust was higher for the rival image than the mixed image ($d = 0.30$, 1-$\beta = .65$). Within-subject comparisons replicated this pattern of results (see Table 2).

H3 was supported, responses to the dual university logo IOS item were biased towards separation, $t_{(324)} = 20.01$, $p < .001$, $d = 1.11$, 95% CI difference: 2.90–3.53, observed power (1-β) = .99. H4 was supported, participants ratings of loyalty as unilateral were biased towards agreement, $t_{(323)} = 7.60$, $p < .001$, $d = 0.43$, 95% CI difference: 0.52–0.89, observed power (1-β) = 0.99. More than twice as many participants (61.3%) agreed than disagreed (28.2%) with the notion that one can be loyal to only one team in a group of competitors, $\chi^2_{(1)} = 39.48$, $p < .001$. H5 was supported, $\chi^2_{(1)} = 33.56$, $p < .001$, open-ended responses to the mixed loyalty image included agreement (199), disagreement (7), neutral (32), and ambiguous (60) statements regarding the proposed social norm. There were 28 times more participant comments agreeing with the social norm for unilateral loyalty than disagreeing with the social norm.

Table 1 Between-subject differences in ratings of emotional reactions by comparison

First image								
Reaction	Favored		Rival		Mixed		$F_{(2,306)}$	p
	M	SD	M	SD	M	SD		.001
Anger	6.42^{a}	11.72	34.84^{b}	33.14	35.14^{b}	34.04	22.68	.001
Confusion	32.03^{a}	37.89	41.11^{a}	32.79	69.48^{b}	31.28	37.20	.001
Disgust	7.60^{a}	15.14	42.52^{b}	37.19	38.86^{b}	33.82	27.11	.001
Enjoyment	52.34^{b}	34.54	17.48^{a}	21.63	26.00^{a}	28.12	32.05	.001
Fear	7.71^{a}	15.09	11.11^{ab}	16.60	16.46^{b}	25.59	4.39	.013
Pride	69.49^{b}	29.46	19.87^{a}	29.67	20.32^{a}	26.03	80.06	.001
Sadness	10.55^{a}	18.78	24.39^{b}	30.92	26.13^{b}	29.95	7.20	.001
Surprise	18.74^{a}	27.24	29.93^{b}	31.49	55.44^{c}	34.64	35.73	.001
Second image								
Reaction	Favored		Rival		Mixed		$F_{(2,304)}$	p
	M	SD	M	SD	M	SD		.001
Anger	5.92^{a}	14.64	40.12^{b}	37.83	35.87^{b}	34.91	22.62	.001
Confusion	9.07^{a}	23.02	22.12^{b}	30.16	61.29^{c}	36.38	74.16	.001
Disgust	6.85^{a}	16.17	45.30^{c}	38.67	34.42^{b}	33.36	25.09	.001
Enjoyment	62.62^{b}	31.75	15.17^{a}	23.79	22.15^{a}	26.10	62.80	.001
Fear	6.15	14.64	11.97	21.77	13.69	23.11	2.82	.061
Pride	69.80^{b}	34.42	15.74^{a}	25.39	20.85^{a}	26.69	79.32	.001
Sadness	6.20^{a}	14.13	23.49^{b}	34.35	24.28^{b}	32.59	8.51	.001
Surprise	9.13^{a}	21.05	15.70^{a}	23.66	52.30^{b}	36.50	60.69	.001

Note: Means with different superscripts indicate significant differences

Discussion

These results provided comprehensive support for four of the five hypotheses (H1, H3, H4, and H5) and mixed support for the other experimental hypothesis (confirming 73% of H2's predictions), replicating and elaborating on the results from study 2. Mixed loyalty displays provoked greater surprise and confusion than matching loyalty displays, though they elicited similar levels of anger and possible lower levels of disgust than the rival image. Mixed loyalty displays were devoid of the pride and enjoyment felt by consistent displays of favored team loyalty. The hypothesis regarding the open-ended responses to the mixed outfit image was framed in terms of agreement with the statement that one can only truly support one team in a set of competitors, rather than belief that this notion exists as a social norm. Most of the responses classified as disagreement and neutral inherently suggested the existence of the norm by noting the rivalry: "Kinda weird he's wearing both teams but okay!"; "I am confused as to why the man is wearing both logos, but I do not have very strong feelings about it." Some of these responses provided a justification for why an individual may support two rival teams, e.g., "I am surprised because not many fans are Michigan and Ohio State fans since they are rival schools, however, my father went to Michigan for undergrad and Ohio State for medical school, so I know that it is possible to like two schools at once."

Study 4

On November 15, 2017, the Cheez-It™ and Pringles™ Facebook accounts launched an advertisement featuring the text "It's always #BowlSeason. Pick up Cheez-It & Pringles for your chance at $10,000 in season ticket cash! Rules: http://bit.ly/2fQ2faC. #CollegeFootball" and a picture of a table set with a white bowl featuring the University of Michigan's Block M and a red cup featuring the logo of Ohio State University. The ads were launched 10 days before "The Big Game," the annual match between the schools at the end of the regular conference season. The marketing campaign created an opportunity for examining naturalistic reactions to a social media post simultaneously featuring the logos of the teams in studies 1–3. The creators of the ad were likely to be aware of the rivalry between the two teams, and that the mixing of the schools may draw more attention and commentary than featuring just one team alone. This would likely have generated activity from Facebook users posting comments and replying to the comments of others, thus increasing the distribution of the ad. The team logos appeared to be digitally superimposed on the images of the objects, rather than being actual branded objects. The background, hypotheses, method, and analyses for study 4 were pre-registered prior to data collection with the Open Science Framework (https://osf.io/5gz9q/).

Table 2 Within-subject differences in ratings of emotional reactions by comparison

Favored team vs. mixed loyalty								
Reaction	Paired differences		95% CI		$t_{(125)}$	p	d	$1\text{-}\beta$
	M	SD	Lower	Upper				
Anger	− 32.38	34.56	− 38.47	− 26.29	− 10.52	.001	− 0.94	1.00
Confusion	− 47.52	44.50	− 55.36	− 39.67	− 11.99	.001	− 1.07	1.00
Disgust	− 32.66	35.23	− 38.87	− 26.45	− 10.41	.001	− 0.93	1.00
Enjoyment	34.43	40.90	27.22	41.64	9.45	.001	0.84	1.00
Fear	− 6.84	23.62	− 11.01	− 2.68	− 3.25	.001	− 0.29	0.49
Pride	53.27	33.68	47.33	59.21	17.76	.001	1.58	1.00
Sadness	− 17.02	33.51	− 22.92	− 11.11	− 5.70	.001	− 0.51	0.89
Surprise	− 44.13	40.19	− 51.21	− 37.04	− 12.32	.001	− 1.10	1.00
Rival team vs. mixed loyalty								
Reaction	Paired differences		95% CI		$t_{(164)}$	p	d	$1\text{-}\beta$
	M	SD	Lower	Upper				
Anger	0.61	24.84	− 3.21	4.42	0.31	.754	0.02	0.06
Confusion	− 23.64	43.57	− 30.34	− 16.95	− 6.97	.001	− 0.54	0.96
Disgust	6.95	23.98	3.26	10.63	3.72	.001	0.29	0.58
Enjoyment	− 9.29	29.70	− 13.85	− 4.72	− 4.02	.001	− 0.31	0.63
Fear	− 5.12	23.04	− 8.66	− 1.58	− 2.86	.005	− 0.22	0.40
Pride	− 8.72	32.59	− 13.72	− 3.71	− 3.44	.001	− 0.27	0.53
Sadness	− 2.86	30.57	− 7.55	1.84	− 1.20	.232	− 0.09	0.14
Surprise	− 22.21	44.80	− 29.10	− 15.33	− 6.37	.001	− 0.50	0.94

Hypotheses Facebook user's comments were expected to provide evidence for the existence of a social norm that one cannot simultaneously be a supporter of two competing groups or teams. Given the authors' experiences with public social media, we expected a large proportion of user (or robot) posts and commentary to be irrelevant to the actual content of the ad. Still, we saw this as an opportunity for additional naturalistic data collection. Theoretical models of norms in social psychology consider the amount of agreement between group members to be variable (e.g., Jackson 1965). Due to the lack of quantitative criteria for demonstrating the existence of a norm, we chose a 4:1 ratio of support to opposition as criteria for general acceptance. H1: Some Facebook users will explicitly express that it is inappropriate to simultaneously have objects featuring the two rival teams in the same setting. H2: Posts explicitly consistent with the social norm will be at least four times as prevalent as posts explicitly inconsistent with the social norm; i.e., expressing support for simultaneously having objects featuring the two rival teams in the same setting. H3: Some Facebook users will make comments calling for the removal of one of the team-branded objects, questioning the presence of one of the team-branded objects, or similar statements consistent with the notion that the objects do not belong in the same setting, without explicitly mentioning the rivalry between the two teams. These comments will be interpreted as consistent with the proposed social norm, as they implicitly reference the rivalry between the two teams and the inappropriateness of mixed loyalty.

Materials

Publicly visible comments on the ads ($N = 318$) by Facebook users between 11/15/2017 and 12/24/2017 were coded for content. This sample was expected to enable adequate statistical power, $(1\text{-}\beta) = .80$, in non-parametric comparisons based on the results of study 2.

Procedure

Comments were categorized as initial posts (new top-level comments) and responses to previous comments (either in a thread of replies or directly referring to a previous comment or Facebook user). Comments were categorized into posts: (1) cheering for or supporting one team; (2) disparaging one team; (3) making comparisons among teams (stating that one team is better than another, without content related to the hypotheses); (4) Explicitly expressing that it is inappropriate to simultaneously have objects featuring the two rival teams in the same setting, that this is unlikely to happen in reality, or other comments questioning or noting the mixed loyalty (as predicted in H1); (5) Statements expressing support for simultaneously

having objects featuring the two rival teams in the same setting, statements that this has happened or would be likely to happen, or statements effectively cheering for both teams (as relevant to H2); (6) Statements calling for the removal of one of the team-branded objects, questioning the presence of one of the team-branded objects, or similar statements consistent with the notion that the objects do not belong in the same setting, without explicitly addressing the rivalry (as predicted in H3); (7) Statements regarding the food products featured in the ads; (8) Other content (disparaging both teams, comments unrelated to the teams or products, etc.). Statements fitting multiple categories were noted, these were not expected to contain contradictory messages (content fitting both #5 and #4 or #6).

Analyses H1 was tested by identifying statements consistent with the proposed social norm (category 4). H2 was tested by identifying category 5 comments and comparing the proportions of category 4 and category 5 comments with a chi-square test. H3 was tested by identifying category 6 comments.

Results

Of 318 comments, 59% were initial comments, 41% were responses to previous comments. Posts typically (95%) qualified for a single category, 5% qualified for two categories, none qualified for more than two categories. No posts contained contradictory messages. "Other" content posts with a wide range of content were the most frequent (39.6%), followed by comments disparaging one team (28.6%), and comments cheering for or supporting one team 15.4%). H1 was supported, 15 Facebook users explicitly indicated that it is inappropriate to simultaneously have objects featuring the two rival teams in the same setting, comprising 4.7% of comments. H2 was supported, 15 times as many Facebook users expressed content explicitly consistent with the social norm than the lone Facebook user (1, 0.3%) expressing that it was possible to have objects featuring the two rival teams in the same setting, $\chi^2_{(1)} = 12.25$, $p < .001$. H3 was supported, 32 Facebook (10.1%) users made comments calling for the removal of one of the team-branded objects, questioning the presence of one of the team-branded objects, or similar statements, without explicitly mentioning the rivalry. Eight comments regarded the featured food products, and four comments made comparisons among teams.

Post hoc analyses indicated that there were 232 posts by 171 different men and 77 posts by 67 different women. Posts were more likely to be made by men than women, $\chi^2_{(1)} = 77.50$, $p < .001$, and men were significantly more likely to post comments than women, $\chi^2_{(1)} = 45.44$, $p < .001$. Some men (30/171) and women (8/67) made multiple posts, with a maximum of 12 and 5 posts, respectively. There were single posts from five individuals whose gender could not be determined, four posts from the Cheez-It™ and Pringles™ official accounts responding to posts regarding these products, and one spam advertisement post unrelated to any other content.

Discussion

Results supported the central hypothesis that having objects featuring the two rival teams in the same setting would be provocative and elicit expressions consistent with the notion that one cannot simultaneously be a supporter of two competing groups or teams. Several comments were quite explicit: "There is no house in the world where you would find this bowl and glass," "Who on earth would have a *ichigan bowel and an Ohio State cup?!," "There is no freaking way that these two things could coexist in the same house." There were twice as many comments calling for the removal of objects without explicitly mentioning the rivalry as there were comments explicitly mentioning the rivalry, suggesting expectations for a common understanding among Facebook users. We note that posts classified as coding categories 1–3, representing 45% of content, explicitly indicate unilateral allegiance. Combining categories 1–4 and 6, 60% of user comments were consistent with the notion of unilateral allegiance. The single comment expressing support that both objects could be in the same setting was "House Divided," acknowledging that there could be two people in the same household who favor different teams in a rivalry. This explanation refers to differential preferences of two individuals within the same household, rather than one individual expressing duality in support. Even this comment may be interpreted as consistent with the notion that an individual can be loyal to only one team in a set of competitors.

General Discussion

Convergent evidence from these four studies supports the existence of a social norm, as well as individual beliefs, that one can only be loyal to one team in a set of competitors. Study 1 demonstrated that displays of mixed loyalty draw attention and provoke observable reactions at higher rates than displays of consistent loyalty in a community with allegiances divided between two prominent rivals. Study 2 demonstrated that residents of this community had nearly universal agreement with the proposed social norm and explicitly attributed surprise and confusion to the displays of mixed loyalty. Study 3 elaborated on the findings of study 2 with a larger sample and more sophisticated measurements, replicating the reactions of surprise and confusion to the mixed loyalty displays and agreement with the proposed social norm. Study 3 also indicated that identification with one university team was associated with identity separation from the other team, and that most viewed the university team identities as separated. Study 4

provided evidence for the social norm in the spontaneous public comments of individuals on social media.

These findings contribute a novel aspect to the literature on evolved coalitional psychology. Social psychologists have long recognized the importance of groups in interpersonal dynamics. There is a wide range of previous literature on coalitional biases, in-group and out-group dynamics, group formation, and group dissolution. Our research advances the understanding of the norms related to group identity. One may have multiple identities and affiliations with different sorts of groups, however, one is expected to limit allegiance to a single coalition within a set of competing groups or teams. The implication is that across domains, individuals expressing mixed affiliations may be seen as less trustworthy and a greater risk for defection. Any individuals expressing mixed loyalties may be seen as a possible threat, not a true in-group member, and may be shunned or excluded.

Other public expressions of mixed loyalties draw attention and provoke reactions, similar to those observed in our studies. A painting of a man wearing mixed clothing suggesting that he was both a Sunni and Shiite Muslim was removed from a recent art exhibition in Abu Dhabi because an official deemed it too controversial (Fahim 2018). Occasional news stories feature parents of children playing on competing teams who wear hybrid jerseys to demonstrate mutual support (Bieler 2014; Campitelli 2017; Gordon 2017; Reiss 2015). As these incidents are considered newsworthy, they may be exceptions that demonstrate the rule.

Team sport rivalries are an ideal domain to test hypotheses and demonstrate principles regarding evolved coalitional psychology and behavior. College football rivalries between competing institutions in the same geographic region have been interpreted as ritualized warfare (Zillmann et al. 1989). Individuals displaying university team affiliations function as group identifiers, and aggregated displays suggest relative dominance over a local area. These displays mimic the territorial markings and ritualized competitions of other animal species and are likely related to numerous proximate motivations and functions.

Future studies may investigate boundary conditions for and moderators of the social norm with other types of teams and competing groups. The methods utilized in this study are generalizable to assess discordance of associations in other domains. For example, a confederate could display allegiance to a particular political party and to various ideologies, organizations, and/or causes. Similar principles may apply to perceptions of kinship, lineage, and ethnicity, though these phenomena may be more complex than groups based on sports team allegiance.

Limitations

In study 1, the narrow scope of view, brief inclusion of individuals, and poor sound quality of our video documentation likely underrepresented reactions across experimental conditions. Observers reported noticing many reactions that were not documented in the footage or represented in the coded data. The camera view was obscured during one observation and part of another observation on the same day. Also, the mall is a popular weekend destination and the somewhat dense population may reduce the likelihood that subjects attended to the confederate, regardless of experimental condition. Indoor shopping malls are filled with stimuli competing for the attention of potential customers, reducing the chance that individuals will notice the confederate. A laboratory environment would provide more control over conditions and facilitate more comprehensive documentation of events; however, the real-world experimental setting has the advantage of ecological validity and elimination of demand characteristics and other potential problems associated with laboratory-based experiments.

In study 2, it was not possible for one individual to simultaneously display stimuli, recite scripted questions, and record verbal statements, emotional reactions, and physical reactions in real time. Videotaping the interaction or having an additional observer recording information may have increased the scope of documentation but may also have interfered with participant recruitment and interview processes in naturalistic settings.

Several participants in study 3 reported in open-ended comments that they did not understand the initial IOS question(s) representing their relationships with the university logos, some noting that they responded incorrectly to these items. This issue appeared to be more common for Michigan-based participants who initially saw the IOS item with the Ohio State logo, as they sometimes reported not recognizing the logo until seeing the other images and questions. This likely increased the noise in the matrix of initial IOS responses and interfered with the testing of both H1 and H2, as categorization of participants and images was dependent on responses to the initial IOS items. Only about half (53%) of the Michigan university-based participants were from Michigan, 42% were from another US state, and 5% were from another nation. Thus, the fan culture of the University of Michigan football team and the rivalry with Ohio State University's football team may not have been an aspect of socialization for many of these participants.

Study 4 makes on opportunistic use of social media content, a venue where the signal-to-noise ratio for information is often quite low, and the propensity for insults and bickering is high. Also, users are making spontaneous comments to the original ad content and other Facebook user's comments, rather than to survey items designed by researchers. It is not known which, if any, other comments users have seen before posting other than comments which are replied to directly. Thus, the standards for evidence considered supportive of the study's hypotheses may be low, though appropriate for

the source of content. Given the novelty of this data source, there are no existing guidelines for interpretation; thus, we used decision rules that we deemed reasonable. The fact that the majority of posted comments were consistent with a unilateral display of allegiance exceeded expectations.

Conclusion

Overall, these studies provide convergent evidence for the existence of a social norm that group loyalty is indivisible between competitors. The combination of innovative and established methodologies provides the benefits of laboratory control and the documentation of real-world phenomena. We demonstrate the value of research combining experimental manipulations of affiliation displays with naturalistic observations of reactions. This novel methodological paradigm may be suitable for examining contrasts in affiliations across a broad range of topical content. Analyses of qualitative responses help confirm the norm violation as the focus of reactions. Adaptions of extensively validated survey psychometrics enables sophisticated statistical analyses, demonstrating that displays of mixed loyalty do not activate the enjoyment and pride produced by one's favored team, and though generating equivalent anger and similar levels of disgust as the rival team, also elicit higher levels of confusion and surprise. Future research may explore additional properties of this social norm, moderators of its strength, and boundary conditions for its applicability.

Compliance with Ethical Standards

Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

References

Alexander, R. D. (1979). *Darwinism and human affairs*. Seattle: University of Washington Press.

Aron, A., Aron, E., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology, 63*, 596–612.

Atran, S. (2003). The genesis of suicide terrorism. *Science, 299*, 1534–1539.

Baumeister, R. F., & Sommer, K. L. (1997). What do men want? Gender differences and the two spheres of belongingness. *Psychological Bulletin, 122*, 38–44.

Bernhard, H., Fischbacher, U., & Fehr, E. (2006). Parochial altruism in humans. *Nature, 442*, 912–915.

Bieler, D. (2014). Watching kids play for both sides of Bears-Lions game? Fuller parents have the perfect jersey. *The Washington Post*. Retrieved from: https://www.washingtonpost.com/news/early-lead/wp/2014/11/26/watching-kids-play-for-both-sides-of-bears-lions-game-fuller-parents-have-the-perfect-jersey/.

Boehm, C. (1999). *Hierarchy in the forest*. London: Harvard University Press.

Bogardus, E. S. (1924). *Fundamentals of social psychology*. New York: Century.

Brewer, M. B. (1979). Ingroup bias in the minimal intergroup situation: A cognitive-motivational analysis. *Psychological Bulletin, 86*, 307–324.

Campitelli, E. (2017). Mama Kelce created an Eagles-Chiefs' mashup jersey to support both Jason and Travis. *NBC Sports*. Retrieved from: http://www.nbcsports.com/philadelphia/the700level/mama-kelce-created-eagles-chiefs-mashup-jersey-support-both-jason-and-travis.

Chagnon, N. A. (1988). Life histories, blood revenge, and warfare in a tribal population. *Science, 239*, 985–992.

Cialdini, R. B., Borden, R. J., Thorne, A., Walker, M. R., Freeman, S., & Sloan, L. R. (1976). Basking in reflected glory: Three (football) field studies. *Journal of Personality and Social Psychology, 34*, 366–375. https://doi.org/10.1037/0022-3514.34.3.366.

Crowther, N. B. (2007). *Sport in ancient times*. Westport: Praeger.

Deaner, R. O., Balish, S. M., & Lombardo, M. P. (2016). Sex differences in sports interest and motivation: An evolutionary perspective. *Evolutionary Behavioral Sciences, 10*, 73–97.

Eibl-Eibesfeldt, I. (1989). *Human ethology*. New York: Aldine de Gruyter.

Ekman, P. (1992). An argument for basic emotions. *Cognition and Emotion, 6*, 169–200.

Emmanuel, G. (2004). *The 100-yard war: Inside the 100-year-old Michigan–Ohio State football rivalry*. Hoboken: Wiley.

End, C. M., Dietz-Uhler, B., Harrick, E. A., & Jacquemotte, L. (2002). Identifying with winners: A reexamination of sport fans' tendency to BIRG. *Journal of Applied Social Psychology, 32*, 1017–1030.

Fahim, K. (2018). As Saudi Arabia relaxes its controls on culture and entertainment, artists dream—and worry. *Washington Post*. Retrieved from: https://www.washingtonpost.com/world/as-saudi-arabia-eases-controls-on-culture-and-entertainment-artists-dream%2D%2Dand-worry/2018/01/10/d480874c-e42c-11e7-a65d-1ac0fd7f097e_story.html.

Goldstein, J. (2003). *War and gender: How gender shapes the war system and vice versa*. Cambridge: Cambridge University Press.

Goodall, J. (1990). *Through a window: My thirty years with the chimpanzees of Gombe*. Boston: Houghton Mifflin.

Gordon, J. (2017). Mathias Pogba and mum Yeo wear half-and-half shirts in support of brothers Paul and Florentin during Europa League clash. *The Sun*. Retrieved from: https://www.thesun.co.uk/sport/2883834/mathias-pogba-and-mum-yeo-wear-half-and-half-shirts-in-support-of-brothers-paul-and-florentin-during-europa-league-clash/.

Jackson, J. (1965). Structural characteristics of norms. In I. D. Steiner & M. Fishbein (Eds.), *Current studies in social psychology* (pp. 301–309). New York: Holt, Rinehart & Winston.

Jansen, S. C., & Sabo, D. (1994). The sport/war metaphor: Hegemonic masculinity, the Persian Gulf War, and the New World Order. *Sociology of Sport Journal, 11*, 1–17.

Keeley, L. (1996). *War before civilization*. New York: Oxford University Press.

Kenrick, D. T., Li, N. P., & Butner, J. (2003). Dynamical evolutionary psychology: Individual decision rules and emergent social norms. *Psychological Review, 110*, 3–28.

Kruger, D. J., Wang, X. T., & Wilke, A. (2007). Towards the development of an evolutionarily valid domain-specific risk-taking scale. *Evolutionary Psychology, 5*, 570–583.

Kruger, D.J., & Kruger, J.S. (2015). An ethological assessment of allegiance to rival universities in an intermediate city. *Human Ethology Bulletin, 30*, 21–29. https://doi.org/10.22330/heb/321/017-028.

Kurzban, R., & Leary, M. R. (2001). Evolutionary origins of stigmatization: The functions of social exclusion. *Psychological Bulletin, 127*, 187–208.

Lindquist, D. C. (2006). "Locating the nation": Football game day and American dreams in central Ohio. *Journal of American Folklore, 119*, 444–488.

Manson, J. H., & Wrangham, R. W. (1991). Intergroup aggression in chimpanzees and humans. *Current Anthropology, 32*, 369–390.

Ostrom, T. M., & Sedikides, C. (1992). The outgroup homogeneity effect in natural and minimal groups. *Psychological Bulletin, 112*, 536–552.

Palmer, C. T., & Tilley, C. F. (1995). Sexual access to females as a motivation for joining gangs: An evolutionary approach. *Journal of Sex Research, 32*, 213–217. https://doi.org/10.1080/00224499509551792.

Pemberton, M. B., Insko, C. A., & Schopler, J. (1996). Memory for and experience of differential competitive behavior of individuals and groups. *Journal of Personality and Social Psychology, 71*, 953–966.

Piacentini, M., & Mailer, G. (2004). Symbolic consumption in teenagers' clothing choices. *Journal of Consumer Behaviour, 3*, 251–262.

Reiss, M. (2015). The best story of Patriots-Titans week? No doubt, it's 'Mama McCourty.' *ESPN*. Retrieved from: http://www.espn.com/blog/new-england-patriots/post/_/id/4788816/the-best-story-of-patriots-titans-week-no-doubt-its-mama-mccourty.

Richardson, B., & O'Dwyer, E. (2003). Football supporters and football team brands: A study in consumer brand loyalty. *Irish Marketing Review, 16*, 43–52.

Ruffle, B. J., & Sosis, R. (2006). Cooperation and the in-group-out-group bias: A field test on Israeli kibbutz members and city residents. *Journal of Economic Behavior and Organization, 60*, 147–163.

Scalise Sugiyama, M., Mendoza, M., & White, F. (2016). Assembling the CIA module: Coalitional play fighting in forager societies. *Poster presented at the annual meetings of the Human Behavior and Evolution Society*, Vancouver, BC.

Schaller, M., Park, J. H., & Faulkner, J. (2003). Prehistoric dangers and contemporary prejudices. *European Review of Social Psychology, 14*, 105–137.

Sherif, M. (1966). *In common predicament: Social psychology of intergroup conflict and cooperation*. Boston: Houghton Mifflin.

Symons, D. (1978). *Play and aggression: A study of rhesus monkeys*. New York: Columbia University Press.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–47). Monterey: Brooks/Cole.

Trice, H. M., & Beyer, J. M. (1984). Studying organizational culture through rites and ceremonials. *Academy of Management Review, 9*, 653–669.

van der Dennen, J. M. G. (2002). Evolutionary theories of warfare in preindustrial foraging societies. *Neuroendocrinology Letters, 23*-(supplement 4), 55–65.

Van Vugt, M. (2009). Sex differences in intergroup competition, aggression, and warfare. *Annals of the New York Academy of Sciences, 1167*, 124–134.

Van Vugt, M., De Cremer, D., & Janssen, D. P. (2007). Gender differences in cooperation and competition: The male-warrior hypothesis. *Psychological Science, 18*, 19–23.

Wang, X. T., Kruger, D. J., & Wilke, A. (2009). Life-history variables and risk-taking propensity. *Evolution and Human Behavior, 30*, 77–84.

Wetherell, M. (1982). Cross-cultural studies of minimal groups: implications for the social identity theory of intergroup relations. In H. Tajfel (Ed.), *Social identity and intergroup relations* (pp. 207–240). Cambridge: Cambridge University Press.

Wilkerson, S. J. (1991). Then they were sacrificed: The ritual ballgame of northeastern Mesoamerica through time and space. In V. Scarborough & D. R. Wilcox (Eds.), *The Mesoamerican Ballgame* (pp. 129–144). Tucson: University of Arizona Press.

Winegard, B., & Deaner, R. O. (2010). The evolutionary significance of Red Sox Nation: Sport fandom as a byproduct of coalitional psychology. *Evolutionary Psychology, 8*, 432–446.

Wrangham, R., & Peterson, D. (1996). *Demonic males: Apes and the origins of human violence*. London: Bloomsbury.

Zillmann, D., Bryant, J., & Sapolsky, B. S. (1989). Enjoyment from sports spectatorship. In J. H. Goldstein (Ed.), *Sports, games, and play: Social and psychological viewpoints* (2nd ed., pp. 241–278). Hillsdale: Lawrence Erlbaum Associates.