Fan shareholding and the boundaries of attitudinal factors of consumer behaviors

Sport, Business and Management: An International Journal

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Received 9 February 2026
Revised 31 August 2026
Accepted 1 September 2026

Abstract

Purpose – Research in consumer and financial markets suggests that holding ownership stakes may be associated with stronger engagement. However, evidence on the relevance of fan shareholding relative to established attitudinal factors of sport consumption remains limited. This study examines whether fan shareholding retains independent behavioral relevance once established attitudinal factors, team identification (TI) and psychological ownership (PO), are taken into account in explaining selected consumer behaviors.

Design/methodology/approach – Cross-sectional survey data were collected from supporters of a single professional football club that conducted equity crowdfunding campaigns. Structural equation modeling was used to estimate associations between TI, PO, fan shareholding, and self-reported consumer behaviors, including tests of potential moderation effects.

Findings – TI showed the most consistent association with the selected behavioral outcomes. Fan shareholding showed a marginal positive association with match attendance but was unrelated to word-of-mouth behavior and did not systematically condition the effects of TI or PO. These findings suggest that the observed pattern is consistent with interpreting fan shareholding as a bounded, symbolic, status-based mechanism whose behavioral relevance depends on the outcome considered rather than as a general predictor of sport consumer behavior.

Originality/value – The study contributes at three levels. Conceptually, it refines the ownership-effect literature by suggesting that fan shareholding functions primarily as a bounded symbolic status rather than a continuously stronger behavioral mechanism. Empirically, it jointly models TI, PO, and fan shareholding within a single structural equation modelling framework. Methodologically, it combines dual operationalizations of ownership with a sentiment-weighted measure of word-of-mouth.

Keywords Fan shareholding, Ownership effect, Psychological ownership, Social identity theory, Team identification

Paper type Research article

Professional football clubs increasingly face the dual challenge of maintaining sporting competitiveness while ensuring long-term financial sustainability. Rising operating costs, volatile revenues, and growing financial risk have intensified the search for financing mechanisms that extend beyond traditional debt and equity financing (Franck and Lang, 2014). Consequently, alternative funding models have attracted growing attention in both sport management research and professional football practice (Weimar, 2019).

Among these alternative mechanisms, supporter-oriented financing has attracted increasing attention because it combines capital raising with direct supporter participation in club financing. Instruments such as crowdfunding, equity crowdfunding, fan shareholding,

Funding: This project was financed by the Polish National Agency for Academic Exchange under the Bekker Programme.

Conflict of interest: The authors declare no conflict of interest.

Sport, Business and Management: An International Journal
Emerald Publishing Limited
e-ISSN: 2042-6798
p-ISSN: 2042-678X
DOI 10.1108/SBM-02-2026-0044

and more recently fan tokens enable supporters to participate financially in the development of their clubs while simultaneously strengthening identification, community involvement, and long-term relationships (Uhrich, 2021; Vollero *et al.*, 2025). Unlike conventional investors, supporters typically seek symbolic, emotional, and relational returns rather than purely financial gains (Weimar and Fox, 2021). Consequently, supporter financing represents more than an alternative source of capital; it constitutes a strategic mechanism through which clubs seek to encourage supporters from consumers into financially engaged stakeholders.

Supporter-oriented financing encompasses various governance arrangements, including member-owned clubs, supporters' trusts, and equity participation by fans (García and Welford, 2015; Sánchez *et al.*, 2021). The present study focuses on fan shareholding, whereby supporters acquire minority equity stakes in their club without necessarily obtaining meaningful influence over decision making. Unlike other supporter-oriented financing mechanisms, fan shareholding establishes a formal ownership relationship between supporters and the club, making it a particularly relevant context for examining whether shareholder status is associated with supporter behavior.

Although clubs may be reluctant to share ownership with fans, existing research suggests that fan shareholding and related ownership arrangements may have implications beyond financial participation. Studies across sport and non-sport contexts indicate that holding ownership stakes can be associated with stronger supporter or customer engagement, including among individuals with different levels of attachment or financial expectations (e.g. Aspara, 2009; Medina *et al.*, 2021; Weimar and Fox, 2021). Whether these associations extend to specific supporter behaviors, such as match attendance and club-related word-of-mouth, remains unclear.

Sport thus serves as a unique context for understanding how acquiring club shares is associated with fan behaviors, particularly match attendance and word-of-mouth. Research has tested how firm stock ownership is associated with behavioral outcomes, often explaining this through social identity theory (Bernard *et al.*, 2018; Medina *et al.*, 2021). However, the attitudinal mechanisms proposed in these explanations were not directly measured, leaving a gap in empirical evidence on the psychological mechanisms underlying this association. By modeling fan shareholding alongside team identification (TI) and psychological ownership (PO), we examine whether its inclusion retains any explanatory relevance once established attitudinal predictors are accounted for.

Building on these observations, and recognizing that supporters who become shareholders may be more strongly engaged than others, this study examines whether fan shareholding is associated with selected consumer behaviors in professional football after accounting for established attitudinal predictors, specifically TI and PO. Rather than treating fan shareholding as a causal determinant of behavior, we evaluate whether it retains independent explanatory relevance within this broader psychological framework. Using structural equation modeling (SEM), we estimate models for match attendance and club-related word-of-mouth behavior and evaluate both direct associations and boundary tests involving shareholding.

Throughout the paper, *fan shareholding* serves as the primary term. The terms *formal ownership* and *shareholder status* are used only in specific contexts: the former when contrasting legal ownership rights and psychological ownership, and the latter when referring to the status-based mechanism examined in this study.

Theoretical framework and hypotheses development

This study draws on psychological ownership (PO) and social identity theory (team identification; TI) as theoretical frameworks. Although these perspectives capture strong psychological relationships with a club, they reflect distinct mechanisms: PO concerns perceived possession (Pierce and Jussila, 2011), whereas TI reflects the extent to which fans define themselves through their connection to a team (Tajfel and Turner, 1986; Lock and Heere, 2017). The two constructs are nevertheless expected to be positively associated because social identification and perceived possession may develop together, while remaining conceptually distinct (Martinović and Verkuyten, 2024). This distinction provides a basis for examining whether each construct accounts for unique variance in fan behavior and whether fan shareholding retains incremental explanatory value beyond these established psychological mechanisms.

Psychological ownership

PO refers to the state in which individuals feel that a target is "theirs," regardless of formal property rights (Pierce *et al.*, 2001). Such feelings emerge through mechanisms including control, intimate knowledge, and investment of the self (Pierce and Jussila, 2011). PO has been shown to strengthen attachment and promote consumer behaviors such as advocacy, stewardship, and loyalty (Fuchs *et al*., 2010). In sport, it increases intentions to attend matches and purchase licensed merchandise (Palau-Saumell *et al.*, 2021), and is a key predictor behind fans' desire to acquire ownership stakes in clubs (Cocieru *et al.*, 2019).

Importantly, PO must be distinguished from formal ownership. While the former is a subjective feeling of possession, the latter represents legal rights and responsibilities. In many cases, formal ownership reinforces PO, as observed in employee stock plans or crowdfunding initiatives (Medina *et al.*, 2021). However, PO can also exist without formal rights, and it often precedes fans' decisions to become formal owners (Cocieru *et al.*, 2019; Kościółek, 2023).

Taken together, prior research suggests that PO complements rather than substitutes TI in explaining fan attachment. Whereas TI explains supporters' relationships with the club through social identity processes (Lock and Heere, 2017), PO captures perceived possession arising from self-investment, intimate knowledge, and feelings of control (Pierce *et al.*, 2001; Pierce and Jussila, 2011). Recent conceptual work further argues that collective PO is closely linked to, yet empirically distinguishable from, group-based identification (Martinović and Verkuyten, 2024). Consequently, although substantial empirical overlap between the two constructs should be expected, PO captures a distinct attachment mechanism and may therefore explain unique variance in fan behavior beyond social identification alone.

H1. PO is positively associated with fan behaviors, including (a) match attendance and (b) club-related word-of-mouth behavior.

Although previous research has not explicitly examined the interaction between PO and fan shareholding in sport, evidence suggests that the two are complementary rather than competing. PO reflects a subjective sense of possession (Pierce *et al.*, 2001; Pierce and Jussila, 2011), whereas formal ownership provides a legal expression of ownership that may coexist with, and reinforce, PO (Cocieru *et al.*, 2019). Studies on employee ownership and customer shareholding further indicate that formal ownership can reinforce existing psychological attachment by strengthening individuals' sense of responsibility and long-term commitment (Medina *et al.*, 2021). Explicitly, formal ownership may validate and reinforce pre-existing feelings of PO by aligning subjective perceptions of possession with legal ownership rights. Accordingly, supporters who experience both psychological and formal ownership may be more likely to translate these feelings into behavioral engagement than supporters whose ownership remains purely psychological.

H2. The positive association between PO and fan behaviors is stronger among fan shareholders than among non-shareholders.

Formal ownership and ownership effect

The ownership effect refers to an empirically observed association between holding ownership stakes and increased engagement with the owned entity. Early studies suggested that shareholders tend to buy more products from the firms they own and recommend them to others (Aspara, 2009). However, these findings relied largely on self-reported data and did not fully address the possibility of reverse causality – that individuals may first be loyal consumers and only then choose to invest ("invest in what you know"; Keloharju *et al.*, 2012). Bernard *et al.* (2018) provided experimental evidence that ownership was associated with subsequent consumer behavior, although the association was smaller than earlier research suggested and stronger among participants with pre-existing affinity.

Subsequent studies reached largely convergent conclusions. Evidence from equity crowdfunding (Hoffmann *et al.*, 2022), customer share reward programs (Medina *et al.*, 2021), and investor behavior (Keloharju *et al.*, 2012) consistently indicates that legal ownership is associated with stronger behavioral commitment. Although these studies differ in context and research design, they point to a common pattern: ownership is accompanied by greater loyalty and continued engagement with the focal organization. To explain this pattern, Clor-Proell *et al.* (2023) argue that ownership may create a stronger psychological stake, making consumers more willing to maintain their relationship with the organization despite unfavorable information.

Collectively, this literature suggests that legal ownership is associated with stronger consumer behavior, but it leaves an important theoretical question unresolved. Most ownership-effect studies have examined legal ownership without simultaneously accounting for established psychological mechanisms such as TI or PO (Bernard *et al.*, 2018; Hoffmann *et al.*, 2022; Medina *et al.*, 2021). Consequently, it remains unclear whether ownership represents an independent behavioral mechanism or whether its apparent effects primarily reflect the stronger pre-existing attachment of individuals who choose to become owners.

These findings are particularly relevant in the sport context. Fans who invest in their favorite club meet the criteria of Bernard *et al.* (2018), as they have a strong preexisting interest in the "product." Unlike typical investors, their primary motivation is not financial returns but emotional attachment (Huth, 2020). This distinctive motivational profile makes sport an especially suitable context for assessing whether legal ownership contributes behavioral engagement beyond established psychological attachments.

H3. Fan shareholding is positively associated with (a) match attendance and (b) club-related word-of-mouth behavior.

Team identification

Social identity theory (Tajfel and Turner, 1986) provides a strong theoretical foundation for understanding fan behavior in sport. Its sport-specific application, TI, reflects the extent to which fans define themselves through their connection to the team and derive emotional and symbolic value from this affiliation (Lock and Heere, 2017).

Evidence accumulated over the past 3 decades consistently identifies TI as one of the strongest attitudinal correlates of sport consumer behavior. A recent meta-analysis synthesizing this literature confirmed robust positive associations between TI and a broad range of consumption outcomes, including attendance, media consumption, merchandise purchasing, and word-of-mouth behaviors (Lee *et al.*, 2025). Accordingly, TI represents the most established psychological explanation of sport consumption against which alternative mechanisms should be evaluated. Although some studies have questioned its predictive power for actual behaviors, Yoshida *et al.* (2015) found community attachment sometimes explains attendance better than TI. Subsequent research has also shows that TI and community ties reinforce each other (Katz *et al.*, 2018).

TI is generally stable over time (Lock *et al.*, 2014), supported by strategies fans employ to cope with threats, such as reframing poor performance or distancing themselves from negative events (Doyle *et al.*, 2017). Yet stability does not mean rigidity. Identification adapts in response to major events, such as player departures or changes in team performance (Delia, 2017; Mansfield *et al.*, 2023). This highlights how TI is simultaneously enduring and responsive, making it the dominant psychological explanation of sport consumer behavior, and the most demanding benchmark against which additional contributions of formal ownership should be evaluated.

H4. TI is positively associated with fan behaviors, including (a) match attendance and (b) club-related word-of-mouth behavior.

Fan shareholding and team identification

Because fan shareholding is typically acquired by highly identified supporters (Huth, 2020; Kościółek, 2023; Wicker *et al.*, 2016), shareholder status is likely to coexist with strong TI. This raises the question of whether fan shareholding merely reflects existing identification or whether shareholder status changes the extent to which identification translates into consumer behavior. Rather than treating fan shareholding as an antecedent of identification, the present study examines the latter possibility. Prior studies show that individuals with ownership stakes are less responsive to negative information and more willing to maintain their association with the organization (Clor-Proell *et al.*, 2023; Keloharju *et al.*, 2012). This suggests that shareholder status may alter the extent to which identification translates into consumption behavior by reinforcing fans' sense of belonging and responsibility.

In the sport context, identification with a club is typically formed through long-term socialization, shared history, and symbolic meaning (Lock and Heere, 2017). Fan shareholding does not necessarily change supporters' level of TI but may strengthen the extent to which existing identification is translated into supporter behavior (Uhrich, 2021; Vollero *et al.*, 2025). Accordingly, if formal ownership appears to reinforce supporters' institutional attachment to the club, the positive association between TI and fan behavior should be stronger among shareholder-supporters than among non-shareholders.

H5. The positive association between TI and fan behaviors is stronger among fan shareholders than among non-shareholders.

Taken together, sport consumer behavior can be explained through three related but theoretically distinct mechanisms. TI explains behavior through social identity processes (Lock and Heere, 2017), PO through perceived possession (Pierce *et al.*, 2001; Pierce and Jussila, 2011), and fan shareholding through legal shareholder status (Bernard *et al.*, 2018; Medina *et al.*, 2021). Because these mechanisms are conceptually related yet theoretically distinct, and because they are expected to overlap empirically, examining them separately provides only limited insight into their unique explanatory contributions. Accordingly, the hypotheses developed below examine whether fan shareholding retains incremental explanatory value beyond TI and PO and whether this contribution differs across distinct forms of sport consumer behavior. The proposed moderation hypotheses extend this framework by examining whether shareholder status conditions the behavioral effects of these two established psychological mechanisms.

Research context

Our study examines the case of Wisła Kraków, Poland's second-oldest football club and one of the largest fanbases in the country. The club issued public shares twice, in 2019 and 2020, through equity crowdfunding campaigns on the Beesfund.com platform. The first campaign raised €1 million from 9,118 investors, while the second attracted 8,880 investors and raised approximately €750,000 (Kościółek, 2022).

Across both campaigns, fan shareholding primarily took the form of small, individualized contributions rather than financially substantive investments. Ownership rights remained highly fragmented and did not translate into differentiated control or decision-making power, while higher investment thresholds offered symbolic or experiential benefits. Wisła Kraków maintained consistent investment thresholds and a fixed share price of 100 PLN across both campaigns, without creating a market for share trading. Thus, share acquisition in this context was largely decoupled from expectations of financial returns.

The present study builds on the same empirical setting as Kościółek (2022, 2023) but addresses fundamentally different research questions. Whereas Kościółek (2022) examined investors' profiles and Kościółek (2023) investigated investment motivations, we examine the behavioral relevance of fan shareholding after investment. Specifically, we test whether fan shareholding provides incremental explanatory value beyond TI and PO.

Method

Measurement

The original measurement scales were adapted only by replacing generic organizational references with references to Wisła Kraków while preserving the substantive wording of the original items. The survey included 12 questions featuring two multi-item scales to measure key constructs: TI and PO. Additionally, it included questions related to investment amounts, shares, behavioral outcomes, and fan characteristics. A detailed overview of all measurement items is presented in Table 2.

Both scales, TI and PO, were introduced with the prompt, "Please indicate your level of agreement with the following statements," and responses were collected using a 7-point Likert scale, where 1 represented "strongly disagree" and 7 represented "strongly agree."

TI was measured using the six-item scale developed by Mael and Ashforth (1992). We relied on this measure because it is explicitly grounded in social identity theory, addressing critiques that sport-specific TI measures lack clear theoretical anchoring in social identity theory (Lock and Heere, 2017). To measure PO, we applied the six-item scale developed by Van Dyne and Pierce (2004), which is widely used across various contexts, including sports fan studies (Palau-Saumell *et al.*, 2021).

In line with our research hypotheses, club-related word-of-mouth behavior and match attendance were the behavioral outcomes included in the study. Considering concerns about the predictive power of behavioral intentions (Yoshida *et al.*, 2015), we measured self-reported fan behaviors rather than behavioral intentions. Specifically, respondents reported how many matches they had attended during the current season. Following Bernard *et al.* (2018), we measured self-reported word-of-mouth by asking, "How many times a month do you discuss Wisla with people outside the fanbase?" Responses were recorded on a five-point ordinal scale: 1 = never, 2 = yearly, 3 = monthly, 4 = weekly, and 5 = daily. They were also asked to rate the tone of these discussions on a bipolar scale (-3 = very negative, 0 = neutral, $+3$ = very positive).

To capture the intensity and evaluative quality of fan communication, we constructed a sentiment-weighted WOM measure by multiplying discussion frequency by discussion tone. This operationalization reflects the assumption that the behavioral value of WOM depends jointly on how often supporters discuss the club and whether those discussions are favorable. As a robustness check, we also estimated identical SEM models using WOM frequency and WOM tone separately.

We also asked fans to indicate the exact amount they had spent on club shares. Since these investments may have been made several years ago, we also asked them to specify the number of shares they had purchased. We expected respondents to provide whichever of these two answers was more convenient for them.

Because non-investors reported an investment amount of zero, a small constant (0.01 PLN) was added to all investment amounts prior to log transformation to avoid the undefined value of ln(0). The constant was chosen because the minimum positive investment (100 PLN) was substantially larger, making the adjustment negligible for investors while allowing the inclusion of non-investors in the investment-based specification. Accordingly, the investment model was estimated using the full sample, with non-investors represented by ln(0.01).

Recognizing that fan club membership might influence fan behaviors (Huth, 2020), we also asked whether participants were or are still members of the club.

Data collection and analysis

Participation was voluntary. Before completing the questionnaire, respondents were informed about the purpose of the study, the anonymous nature of participation, and the use of their responses for research purposes, after which they provided informed consent electronically. No incentives were offered for participation.

The questionnaire was administered in Polish. Surveys were distributed through the club's social media channels, with posts published on March 19, 2025 on Facebook, Instagram, and X. In total, 386 fully completed surveys were obtained. Because all questionnaire items were mandatory, the dataset contained no item-level missing data. Given the voluntary nature of participation and recruitment through the club's official communication channels, the sample may overrepresent more highly engaged supporters and should not be interpreted as representative of the broader supporter population.

Once the data were collected, postal codes were used solely to classify respondents as residing within or outside Kraków. After this recoding procedure, the original postal-code information was removed from the analytical dataset to preserve respondent anonymity. Following a screening of the declared number of matches attended in the ongoing season, we excluded seven responses in which the reported attendance exceeded the highest possible value. Data were collected from March 19–23, 2025, by which time Wisła had already played 34 matches that season across all competitions, including league and cup fixtures, both home and away. We also excluded 11 respondents under the age of 22 who reported having purchased shares, as they would have been younger than 18 during the club's second equity crowdfunding campaign in 2020 and therefore could not have legally purchased shares themselves. Consequently, our final research sample comprised 368 fans.

Among these respondents, 51.85% were club shareholders (Table 1). The shareholders and non-shareholders groups were generally similar, although the proportion of males was slightly higher among investors (82.8% versus 71.4%), as was the proportion of residents of the club's home city (40.3% versus 37.4%). Greater differences emerged in terms of age ($M_{INV} = 39.672$ versus $M_{NON\text{-}INV} = 31.709$) and fan-club membership (46.8% versus 18.7%). This can be explained by the time lag between the club's crowdfunding campaigns in 2019 and 2020 – which prevented the youngest fans from purchasing shares – and the higher level of engagement typical of fan-club members, which in turn may have encouraged investment in the club.

Analysis of the raw data shows that fans generated WOM at a moderate frequency ($M > 3.5$ on a 1–5 scale for both investors and non-investors), with a slightly positive tone ($M > 4.0$) (Table 2). In both cases, mean values were higher among investors, and in the weighted WOM (WOM-W) measure, no highly frequent and extremely negative discussants were observed (the lowest WOM-W scores were −10 for non-investors and −8 for investors). Fan investors also attended matches more often, averaging one additional match per season compared with non-investors ($M_{INV} = 9.656$ [$SD = 6.358$] versus $M_{NON\text{-}INV} = 8.374$ [$SD = 6.241$]).

The average amount invested was 2,018.28 PLN, but nearly three-quarters (73.1%) of fans invested between 100 and 500 PLN. To address the high dispersion of investments ($SD > 8{,}500.00$) and data skewness caused by a few exceptionally large contributions (10,000–100,000 PLN), we log-transformed the investment variable following standard practice for highly right-skewed monetary variables (e.g. Wooldridge, 2010).

The main analyses were conducted in STATA using structural equation modelling (SEM). In line with our hypotheses, we tested the association between fan shareholding and the behavioral outcomes of interest, namely match attendance and club-related word-of-mouth behavior (in two specifications). In addition, we examined whether the association between TI, PO, and fan behaviors differed according to formal ownership, examining whether

Table 1. Sample characteristics

	Non-investors M	SD	Investors M	SD
WOM-Unweighted	3.637	0.997	3.704	0.926
WOM-Weighted	4.154	5.015	4.618	4.597
Match Attendance	8.374	6.241	9.656	6.358
Age	31.709	9.269	39.672	9.605
Amount of Investment (PLN)	–	–	2,018.280	8,577.935
Ln (Amount of Investment)	–	–	6.072	1.375
Woman	0.286	–	0.172	–
Krakow	0.374	–	0.403	–
Fan Club Membership	0.187	–	0.468	–

Table 2. Confirmatory factor analysis

	λ	z	M	SD
TI (AVE = 0.437; CR = 0.788)				
TI1: When someone criticizes [the Club], it feels like a personal insult	0.653	–	4.883	1.627
TI2: I am very interested in what others think of [the Club]	0.455	7.74***	4.948	1.524
TI3: When I talk about [the Club], I usually say "we" rather than "they"	0.540	8.79***	6.136	1.346
TI4: When [the Club] succeeds, it feels like a personal success	0.761	11.54***	5.606	1.478
TI5: When someone praises [the Club], it feels like a personal compliment	0.826	12.67***	5.332	1.398
PO (AVE = 0.507; CR = 0.859)				
PO1: This is my club	0.616	–	6.090	1.422
PO2: I sense this club belongs to its fans	0.784	11.26***	5.215	1.536
PO3: I feel a very high degree of personal ownership for this organization	0.743	11.22***	4.818	1.705
PO4: I sense this club belongs to me as a fan	0.797	11.73***	5.087	1.713
PO5: This is our club	0.679	13.33***	6.272	1.088
PO6: Club fans feel as though they own the club	0.631	9.82***	4.940	1.584

Note(s): χ^2(df) = 137.848 (42), $p < 0.001$; χ^2/df = 3.282, RMSEA = 0.079, CFI = 0.943, TLI = 0.925, SRMR = 0.058. cov(TI, PO) = 0.655***, cov(PO1, PO5) = 0.335***
***$p < 0.001$

shareholder status conditioned the observed associations of these predictors. Importantly, the model is specified analytically rather than as a unidirectional causal process, and alternative causal orderings among constructs remain theoretically plausible.

Furthermore, given prior evidence that demographic characteristics influence fan behaviors (Huth, 2020; Weimar and Fox, 2021; Wicker *et al.*, 2016), and considering the differences observed between investors and non-investors in this regard, the model included control variables for age, gender, place of residence, and fan club membership (Huth, 2020). To allow for the possibility that the relationship between age and the behavioral outcomes is nonlinear, both age and age squared were included in the regression models. Although multi-group SEM can be used to examine moderation by categorical variables, it is most appropriate when the research question concerns differences in the overall structural model across groups. Because our hypotheses concerned whether shareholding conditions specific relationships within a common psychological framework, moderation was examined using interaction terms within a single-group SEM.

To test moderation effects, interaction terms were constructed using factor-score–based composites rather than item-level products. Specifically, TI and PO were operationalized as weighted composite scores, where each item was weighted by its standardized factor loading obtained from the confirmatory factor analysis. Before constructing the interaction terms, both composite scores were mean-centered to reduce non-essential multicollinearity. The centered scores were then multiplied by the investment variable to form the interaction terms (investment $\times$ TI; investment $\times$ PO). This approach preserves the latent structure of the constructs while avoiding the substantial increase in model complexity and estimation instability associated with item-by-item interaction models. Factor-score–based interactions are commonly used in structural modeling when the focus is on conditional effects rather than latent interaction estimation (see Little *et al.*, 2006). Because the interaction terms were constructed from observed composite scores rather than estimated as latent interactions, the moderation coefficients reported in the structural models are unstandardized. To assess the robustness of the moderation findings to the representation of the focal constructs, we additionally re-estimated the moderation models using CFA-weighted composite scores.

To assess multicollinearity, variance inflation factors (VIFs) were calculated using auxiliary OLS regressions with the same set of predictors included in the SEM models. VIF values for the substantive predictors ranged from 1.28 to 4.02, well below the commonly recommended threshold of 5. Higher VIF values were observed only for Age and Age^2 (46.7–47.5), which is expected because the quadratic term is mathematically derived from age and does not indicate problematic multicollinearity (Aiken and West, 1991).

Following Hair *et al.* (2010), we evaluated the model using the following criteria: (a) theoretical relevance, drawing from prior research; (b) global fit metrics, such as the chi-square goodness-of-fit test, Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI); (c) microfit measures, including parameter estimates and the Root Mean Squared Error of Approximation (RMSEA); and (d) parsimony, ensuring the model used the minimum number of parameters required. Model fit indices and interpretation of other validation criteria followed the guidelines set by Fornell and Larcker (1981), Hair *et al.* (2010), and Kline (2005).

To assess the robustness of the findings and address potential concerns regarding self-selection into shareholding, three additional robustness procedures were performed. First, an additional robustness analysis based on stabilized inverse probability of treatment weighting (IPTW) was conducted. Propensity scores were estimated using observable pre-treatment characteristics available for both shareholders and non-shareholders, namely age, gender, place of residence (Krakow), and fan club membership. The resulting stabilized weights were used to re-estimate the SEM models. Although propensity score weighting cannot eliminate bias arising from unobserved confounders or establish causal relationships, it improves comparability between shareholders and non-shareholders on observed characteristics and provides a useful robustness check for the reported associations. TI and PO were intentionally excluded from the propensity score model because they constitute the focal explanatory constructs of the theoretical model and may themselves reflect processes related to the investment decision, making their inclusion susceptible to overadjustment.

Second, subgroup analyses were conducted to examine whether the observed relationships were consistent across supporter segments differing in their level of prior engagement. Specifically, the SEM models were estimated separately for supporters with lower and higher levels of TI, classified according to the sample median, and for fan club members and non-members. These analyses were intended as robustness checks rather than tests of additional hypotheses.

Third, because match attendance represents a bounded count variable, Poisson and negative binomial regression models were additionally estimated as robustness checks for the attendance outcome.

Results

Confirmatory factor analysis (CFA) was conducted to evaluate the measurement model comprising TI and PO. The initial model showed acceptable but improvable fit, $\chi^2(53) = 199.480$, $p < 0.001$, $\chi^2/\text{df} = 3.764$, RMSEA = 0.087, CFI = 0.914, TLI = 0.893, and SRMR = 0.056. Following common guidelines for reflective measures (e.g. Kline, 2005; Hair *et al.*, 2010), we removed TI6 due to a very low standardized loading ($\lambda = 0.226 < 0.40$), indicating that it did not adequately represent the latent factor. TI6 captures a more symbolic or self-definitional facet of identification than the remaining items, which primarily reflect affective attachment and perceived belonging. Because TI is widely recognized as multifaceted, not all facets necessarily cohere equally within a single latent factor in applied measurement models; the retained items therefore represent the dominant affective dimension captured by this operationalization. Accordingly, the retained TI factor should be interpreted as primarily reflecting affective identification rather than the full conceptual breadth of the construct.

Furthermore, modification indices (MI > 40) suggested substantial residual covariance between two PO items, PO1 ("This is my club") and PO5 ("This is our club"). Because their near-identical wording implies content overlap and shared method variance not captured by the latent factor, we allowed their residuals to correlate. We restricted post-hoc changes to this single, theory-grounded adjustment to avoid capitalizing on chance. After these modifications, model fit improved to $\chi^2(42) = 137.848$, $p < 0.001$, $\chi^2/\text{df} = 3.282$, RMSEA = 0.079, CFI = 0.943, TLI = 0.925, and SRMR = 0.058. All remaining factor loadings were statistically significant ($p < 0.001$), and the substantive interpretation of both constructs was unchanged (Table 2).

An assessment of reliability and convergent validity indicated that the AVE for *TI* was slightly below the conventional 0.50 benchmark (AVE = 0.437), whereas its composite reliability was acceptable (CR = 0.788). Consistent with Fornell and Larcker (1981) and applied SEM guidance, AVE values below 0.50 can be considered acceptable when composite reliability is adequate; accordingly, the construct was retained. Discriminant validity was assessed using the Fornell–Larcker criterion by comparing AVE values with squared correlations (r^2) between constructs. In the standardized solution, the latent correlation between *TI* and *PO* was $r = 0.655$ ($p < 0.001$), and the squared correlation ($r^2 = 0.429$) was lower than each construct's AVE (TI: 0.437; PO: 0.507), satisfying the criterion.

To capture the structure of the data as accurately as possible, we estimated two sets of SEM models in which fan shareholding was examined alongside TI, PO, and control variables in predicting self-reported consumer behaviors, namely match attendance and word-of-mouth (in two specifications). The first specification excluded moderation effects (Model 1), while the second incorporated them (Table 3). To strengthen our inferences, we further estimated analogous models in which the binary indicator of fan shareholding was replaced with the logarithm of the investment amount (Table 4). Across all estimations, the models explained a satisfactory proportion of variance in the dependent variables ($R^2 > 0.10$), which is common in research on complex consumer behaviors, and demonstrated very good overall fit, with SRMR <0.05.

In our first specification (without moderation), and consistent with H3a, fan shareholding was positively linked to the level of match attendance ($p < 0.10$). Although the estimate was in the hypothesized direction, the evidence should be interpreted as suggestive rather than conclusive. Contrary to H3b, however, no effect was found for either of the word-of-mouth outcomes, namely the unweighted frequency of discussion (WOM) or the weighted measure accounting for tone (WOM-W) (Table 3). Across all three behavioral outcomes, TI was a significant predictor, supporting H4, while PO showed no effect in any case, leading us to reject H1.

At the same time, fans who joined the club's official fan club were more likely to discuss the club, particularly in a positive tone, and to attend matches more frequently than their level of TI alone would suggest. Unsurprisingly, fans residing in Krakow attended more often than others.

Table 3. SEM results – main models

	Model 1 WOM	WOM-W	MA	Model 2 WOM	WOM-W	MA
Fan Shareholding	−0.004	−0.411	1.331*	0.607	1.495	2.443
	(0.117)	(0.591)	(0.692)	(0.674)	(2.258)	(1.512)
Team Identification (TI)	0.375***	1.744***	0.898*	5.795	18.132	10.761
	(0.099)	(0.464)	(0.538)	(3.748)	(12.261)	(8.559)
Psychological Ownership (PO)	−0.198	−0.421	−0.458	−6.650	−20.290	−12.266
	(0.125)	(0.615)	(0.666)	(4.571)	(14.985)	(10.540)
Fan Shareholding × TI	–	–	–	−6.072	−18.061	−11.469
				(3.995)	(13.087)	(9.180)
Fan Shareholding × PO	–	–	–	5.437	16.618	10.370
				(3.803)	(12.397)	(8.702)
Krakow	0.151	0.337	2.073***	−0.040	−0.245	1.688*
	(0.097)	(0.491)	(0.641)	(0.454)	(1.470)	(1.024)
Woman	−0.003	0.396	−0.600	−0.340	−0.609	−1.146
	(0.105)	(0.426)	(0.552)	(0.421)	(1.348)	(0.975)
Age	−0.050	−0.209	−0.748***	−0.036	−0.193	−0.717**
	(0.034)	(0.163)	(0.236)	(0.142)	(0.475)	(0.344)
Age^2	0.001*	0.003	0.009***	0.001	0.004	0.009**
	(0.0004)	(0.002)	(0.003)	(0.002)	(0.006)	(0.004)
Fan Club Membership	0.256**	1.356**	2.649***	0.463	2.004	2.989**
	(0.111)	(0.554)	(0.759)	(0.485)	(1.646)	(1.178)
Constant	4.260***	6.867**	21.465***	3.034	3.492	19.176***
	(0.595)	(2.991)	(4.346)	(2.724)	(8.990)	(6.545)
R-squared	0.135	0.152	0.131	0.471	0.279	0.154
SRMR	0.047			0.041		

Note(s): Unstandardized coefficients (B). Robust standard errors in parentheses
***p < 0.01, **p < 0.05, *p < 0.1

The coefficients for age and age^2 also indicated a nonlinear association between age and attendance.

When extending the model to include interactions between formal ownership and both TI and PO, the results changed substantially (Model 2). The inclusion of interaction terms changes the interpretation of main effects, which become conditional on the moderator. The interaction terms did not indicate a systematic amplification or attenuation of the psychological effects; instead, their small and opposing influences canceled out, yielding no consistent conditional effect of fan shareholding. In the case of WOM-W, the positive main effect of TI ($p < 0.05$) was counterbalanced by its interaction with formal ownership ($p < 0.10$). A similar pattern was observed for PO with WOM-W. Most importantly for our hypotheses, the results indicate that fan shareholding does not alter the effects of TI or PO on consumer behaviors, leading us to reject our moderation hypotheses H2 and H5.

Although the equation-level R^2 for WOM increased after including the interaction terms, this increase was not accompanied by statistically significant interaction effects. Neither the individual interaction coefficients nor the joint Wald tests provided evidence that fan shareholding systematically conditioned the relationships between TI, PO, and the behavioral outcomes. Furthermore, the robustness analysis based on CFA-weighted composite scores yielded substantively equivalent conclusions with only marginal changes in explained variance (Appendix Table A1), indicating that the increase in equation-level R^2 does not alter the substantive interpretation of the moderation results.

The alternative specification of fan shareholding, based on the logarithm of the investment amount, reinforces our findings, as the results are consistent with those obtained using the binary operationalization. In this model (Table 4), fan shareholding again links to only match

Table 4. SEM results – alternative models

	Model 1 WOM	WOM-W	MA	Model 2 WOM	WOM-W	MA
Amount of Investment	0.002	−0.033	0.168**	0.002	−0.031	0.168**
	(0.011)	(0.056)	(0.067)	(0.011)	(0.056)	(0.067)
Team Identification (TI)	0.377***	1.747***	0.934*	0.422***	1.716***	1.232**
	(0.100)	(0.468)	(0.537)	(0.116)	(0.548)	(0.590)
Psychological Ownership (PO)	−0.202	−0.425	−0.544	−0.232*	−0.428	−0.894
	(0.126)	(0.622)	(0.665)	(0.140)	(0.712)	(0.715)
Investment × TI	–	–	–	−0.018	0.054	−0.127*
				(0.014)	(0.060)	(0.074)
Investment × PO	–	–	–	0.006	−0.023	0.108
				(0.012)	(0.058)	(0.066)
Krakow	0.150	0.332	2.066***	0.150	0.338	2.016***
	(0.097)	(0.490)	(0.637)	(0.098)	(0.494)	(0.640)
Woman	−0.002	0.403	−0.605	−0.024	0.436	−0.612
	(0.104)	(0.424)	(0.544)	(0.095)	(0.427)	(0.547)
Age	−0.051	−0.212	−0.776***	−0.044	−0.231	−0.752***
	(0.034)	(0.163)	(0.236)	(0.035)	(0.163)	(0.241)
Age^2	0.001*	0.003	0.009***	0.001	0.004*	0.009***
	(0.0004)	(0.002)	(0.003)	(0.0005)	(0.002)	(0.003)
Fan Club Membership	0.249**	1.354**	2.494***	0.247**	1.364**	2.480***
	(0.112)	(0.552)	(0.765)	(0.113)	(0.550)	(0.761)
Constant	4.290***	6.741**	22.639***	4.162***	7.065**	22.128***
	(0.612)	(3.063)	(4.385)	(0.618)	(3.052)	(4.451)
R-squared	0.135	0.152	0.138	0.145	0.160	0.148
SRMR		0.047			0.045	
n		368			368	

Note(s): Unstandardized coefficients (B). Robust standard errors in parentheses
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

attendance, while TI remained the central attitudinal factor of all three consumer behaviors. The inclusion of interaction terms did not change this pattern, as no moderation effects were observed for either TI or PO. Control variables also remained important predictors: membership in the official fan club was positively associated with both match attendance and word-of-mouth behaviors, while age and place of residence further explained variation in attendance.

The consistency of the findings was also evident across alternative operationalizations of WOM. Estimating identical SEM models using discussion frequency, discussion tone, and the sentiment-weighted WOM measure produced virtually identical substantive conclusions (Appendix Table A2). Across all three specifications, TI remained positively associated with WOM, whereas neither fan shareholding nor PO exhibited statistically significant associations. Likewise, fan club membership consistently predicted more favorable WOM outcomes. These results indicate that the reported findings are not driven by the specific operationalization of WOM adopted in the main analyses.

To assess whether the observed associations could be explained by self-selection into shareholder status, we re-estimated the SEM models using stabilized inverse probability of treatment weighting (IPTW). These models improved covariate balance between shareholders and non-shareholders in age, gender, place of residence, and fan club membership (Appendix Table A3) and produced a similar pattern of results (Appendix Table A4). TI remained positively associated with WOM, PO remained unrelated to the outcomes, and the moderation hypotheses were not supported. The shareholder–attendance association weakened and became non-significant after weighting, suggesting that it partly reflects pre-existing differences between shareholders and non-shareholders.

Additional subgroup analyses indicated that the substantive interpretation of the findings remained stable across supporter segments (Appendix Table A5). Among supporters who were not members of an official fan club, the pattern of associations closely resembled the primary analyses. Among fan club members, the effects of TI became substantially weaker, which may reflect the relatively homogeneous and uniformly high level of identification within this subgroup. Importantly, PO remained unrelated to the behavioral outcomes in both groups, and no evidence supporting the moderation hypotheses emerged.

As an additional robustness check, the attendance model was re-estimated using Poisson and negative binomial regression to account for the count nature of the dependent variable. Across both specifications, shareholder status remained positively associated with attendance, whereas PO remained non-significant. The substantive interpretation of the attendance results therefore remained unchanged (Appendix Table A6).

Given that fan shareholding was significantly associated only with match attendance, we examined this relationship in greater detail to assess its practical implications for stadium attendance. We generated predictions for the “typical” fan, based on sample characteristics, defined as residing in Krakow, male, with age and age squared set at their sample means, not holding a fan club membership, and scoring at the mean level of PO. We then varied TI, the key explanatory variable for attendance, across three percentile benchmarks: the 25th percentile (low identification, score = 4.785), the 50th percentile (medium identification, score = 5.526), and the 75th percentile (high identification, score = 6.156). These percentiles were used to represent low, medium, and high levels of TI within the sample for the purpose of illustrating predicted values. They were based on the non-interaction models for both specifications, namely the model with fan shareholding as a binary indicator and the model with the logarithm of the investment amount (Table 5).

The results indicate that being a shareholder is associated with an increase of roughly 1.3 matches attended per season. For fans with lower TI, attendance was predicted to rise from 8.38 to 9.71 matches when owning shares, whereas for highly identified fans the increase was from 9.43 to 10.76 matches. Similar patterns emerged when replacing the fan shareholder dummy with the logarithm of investment amount. In this specification, the step from non-investor to even a minimal investment of 100 PLN produced a comparable increase in predicted attendance (from 8.16 to 9.70 for low-identified fans, and from 9.25 to 10.79 for highly identified). However, higher levels of investment did not generate additional meaningful gains. Overall, these findings indicate that the effect is meaningful in size, but

Table 5. Predicted match attendance by fan shareholding and team identification (95% CIs in parentheses)

	TI = Q1	TI = median	TI = Q3
Fan shareholding			
Non-shareholder	8.38 (7.15, 9.61)	9.00 (7.78, 10.22)	9.43 (7.99, 10.87)
Shareholder	9.71 (8.33, 11.10)	10.33 (9.00, 11.66)	10.76 (9.25, 12.27)
Investment amount			
None	8.16 (6.94, 9.37)	8.81 (7.62, 10.00)	9.25 (7.84, 10.66)
100 PLN	9.70 (8.40, 11.00)	10.35 (9.10, 11.60)	10.79 (9.34, 12.24)
200 PLN	9.82 (8.47, 11.17)	10.47 (9.16, 11.77)	10.91 (9.41, 12.40)
500 PLN	9.97 (8.55, 11.39)	10.62 (9.24, 12.00)	11.06 (9.51, 12.62)

Note(s): Predicted values are based on two separate structural equation models: one including binary shareholder status and one including the logarithm of investment amount. All predictions were calculated with psychological ownership fixed at its mean (latent score = 0), age and age squared fixed at their sample means, and Kraków = 1, woman = 0, and club membership = 0. Values in parentheses are 95% confidence intervals they underscore that the key predictor is the fact of being a shareholder, while the invested amount itself plays only a secondary role.

Discussion and conclusions

Our study provides new insights into the role of fan shareholding as a bounded, symbolic mechanism of supporter engagement. Specifically, the observed status-versus-magnitude pattern is consistent with interpreting fan shareholding as a bounded symbolic mechanism of supporter engagement. By explicitly modeling TI, PO, and fan shareholding, the findings indicate that TI remains the strongest attitudinal correlate of consumption, whereas the behavioral relevance of fan shareholding is selective and outcome-specific. These findings advance sport management debates on ownership and identification, while also contributing to broader consumer research by clarifying how different psychological and formal mechanisms jointly relate to fan behavior.

Fan shareholding

Fan shareholding was positively associated with match attendance, consistent with H3 and prior evidence that ownership-based behavioral differences are strongest when they build on pre-existing consumer relationships (Bernard *et al.*, 2018; Hoffmann *et al.*, 2022). However, this association weakened after IPTW adjustment, suggesting that it partly reflects pre-existing differences between supporters who voluntarily acquired shares and those who did not.

Importantly, the form of ownership examined in this study should not be equated with supporter governance. Unlike member-owned clubs, supporters' trusts, or governance arrangements such as the German *e.V.* model, where ownership is linked to formal participation in club decision-making (García and Welford, 2015; Uhrich, 2021), the equity crowdfunding examined here represents fragmented minority ownership that provides supporters with shareholder status but only limited influence over managerial decisions. Consequently, our findings concern the behavioral implications associated with shareholder status, which may derive from its symbolic meaning rather than from democratic control over the club. Although the symbolic interpretation is theoretically consistent with the observed status-versus-magnitude pattern, the present study did not directly measure symbolic motives or perceived shareholder recognition. Future research should examine these mechanisms explicitly.

The absence of additional behavioral differences across higher investment levels is consistent with the interpretation that fan shareholding functions primarily as a categorical marker of commitment rather than reflecting increasing financial utility. Because financial expectations and investment motives were not directly measured, this interpretation should be regarded as theoretically grounded rather than as direct evidence. This interpretation may be especially applicable in equity crowdfunding settings, where illiquid and non-tradable shares may derive greater value from their symbolic meaning than from their financial characteristics (Medina *et al.*, 2021).

The abovementioned suggests that the explanatory power of fan shareholding overlaps strongly with psychological constructs, particularly TI. In other words, the behaviors associated with ownership are closely intertwined with existing psychological bonds, making it difficult to isolate an independent effect once these relationships are modeled together.

Team identification

Consistent with H4, TI was a significant correlate with both match attendance and word-of-mouth in the baseline specification, reinforcing its well-established role in sport consumer research (Katz *et al.*, 2018; Palau-Saumell *et al.*, 2021). Although its direct effect disappeared in the interaction model, this does not undermine its theoretical centrality. Conceptually, our findings reinforce the centrality of TI in the sport consumer behavior literature. It represents a deep-rooted social identity mechanism, as described by social identity theory (Tajfel and Turner, 1986), which makes it a particularly stable and robust attitudinal correlate of fan behavior (Lock *et al.*, 2014). In contrast, fan shareholding appears to function mainly as a symbolic layer alongside this foundation.

Psychological ownership

No evidence was found for the positive association hypothesized in H1. PO was not significantly associated with either match attendance or word-of-mouth in our models. One possible explanation is that PO may be more strongly related to discrete, identity-driven decisions such as acquiring club shares, where feelings of possession motivate investment decisions (Cocieru *et al.*, 2019; Kościółek, 2023), than to routine supporter behaviors. This interpretation remains tentative, as the null association may reflect overlap with TI or restricted variance in a highly engaged sample. Thus, the findings do not imply that PO lacks behavioral relevance, but that its unique association with these outcomes was not detectable once TI and formal ownership were modeled jointly.

PO captures a sense of personal possession and control over the club (Pierce *et al.*, 2001), but our results suggest that its observed association appears to be context-dependent and may diminish once formal ownership and identification are established. Future research should therefore explore under what conditions PO continues to shape post-investment consumption, and whether it plays a more decisive role in other types of consumer behaviors beyond attendance and word-of-mouth.

Theoretical contributions

Our findings extend the ownership-effect literature by identifying an important boundary condition. Fan shareholding alone does not appear to represent a general behavioral mechanism once established psychological attitudes are considered. Instead, its behavioral relevance is selective, symbolic, and outcome dependent. Moreover, the observed status-versus-magnitude pattern is consistent with interpreting shareholder status as primarily symbolic rather than driven by the magnitude of financial investment.

Taken together, the findings indicate TI remains the most robust predictor of consumer behaviors, whereas fan shareholding does not function as a general independent predictors across outcomes. Shareholding is selectively associated with match attendance but not with word-of-mouth outcomes, and it does not systematically alter the effects of TI or PO. These findings refine expectations regarding the behavioral relevance of fan shareholding relative to established attitudinal factors in sport.

Furthermore, our findings add nuance to applications of social identity theory in sport management. The attenuation of TI's direct effects in interaction models illustrates the difficulty of empirically separating identity-based mechanisms from shareholder status when both are strongly correlated. This highlights the need for future work to examine the conditions under which ownership amplifies or merely overlaps with identity-driven behaviors. Similarly, the absence of effects for PO challenges assumptions that it universally translates into consumption. While prior studies identified its role in motivating investments (Cocieru *et al.*, 2019; Kościółek, 2023) and co-existing with TI in explaining consumer behaviors (Palau-Saumell *et al.*, 2021), our results suggest that its influence depends on the type of outcome. It may be more salient for discrete, identity-driven decisions such as acquiring shares, and less for routine behaviors like attendance or word-of-mouth, although future research is needed to distinguish this possibility from alternative explanations, including overlap with TI and restricted variance in highly engaged supporter samples.

Finally, the lack of support for the moderation hypotheses offers an important refinement to existing theory. Prior work has suggested that acquiring ownership may strengthen psychological ties (Bernard *et al.*, 2018; Hoffmann *et al.*, 2022; Medina *et al.*, 2021). Contrary to H2 and H5, we found no evidence that the positive associations between

PO or TI and supporter behaviors were stronger among shareholders than among non-shareholders.

Practical implications

From a managerial perspective, the findings suggest that, when clubs implement fan shareholding initiatives, broad and accessible participation may be more consistent with the observed status-versus-magnitude pattern than encouraging larger individual investments. Because TI remained the strongest correlate of supporter behaviors, fan shareholding should be viewed as complementary to, rather than a substitute for, initiatives that strengthen supporters' identification with the club. More broadly, fragmented equity ownership may provide a symbolic form of supporter participation without necessarily creating meaningful influence over organizational decision-making.

Methodological remarks

Our study also contributes methodologically. First, diagnostic tests revealed redundancy within the PO scale, particularly between two closely related items ("This is my club" and "This is our club"). While this overlap is unlikely to have affected the substantive results, it highlights the need for more parsimonious operationalizations that avoid redundancy and improve discriminant validity. Refining the scale in this way would strengthen conceptual clarity without altering the construct's theoretical foundations. Future research may therefore benefit from revising the PO scale by eliminating semantically overlapping items while preserving coverage of the underlying construct. Similarly, the removal of one TI item suggests that not all facets of the original scale contribute equally in supporter contexts. The retained items primarily capture affective attachment and perceived belonging, whereas more symbolic or self-definitional aspects of TI may warrant further examination in future sport management research.

Second, our findings support the use of a sentiment-weighted operationalization of word-of-mouth. Estimating identical SEM models with discussion frequency, discussion tone, and the combined weighted measure produced highly consistent structural relationships. At the same time, the weighted measure yielded the strongest association with TI, suggesting that it captures not only how often supporters discuss the club but also whether these discussions are favorable. Rather than replacing conventional WOM measures, the weighted operationalization provides a more comprehensive representation of fan advocacy by integrating both communication intensity and evaluative tone. Given that WOM in sport management research is typically operationalized solely as discussion frequency, incorporating sentiment weighting may represent a useful methodological refinement that warrants further validation.

Finally, by showing that socio-demographic and engagement-based variables such as age, gender, and fan club membership systematically differentiate consumption behaviors, we extend prior research that identified these factors as determinants of investment decisions (Huth, 2020; Weimar and Fox, 2021; Wicker *et al.*, 2016). Their demonstrated significance here shows that overlooking such variables risks an incomplete account of fan behavior, as much of the literature has privileged psychological constructs alone. The equity crowdfunding setting further underscores the symbolic character of ownership, offering a valuable context for extending insights into both sport and broader consumer markets.

Limitations and recommendations

Because respondents were recruited through the club's official social media channels, caution is warranted when generalizing the findings to the broader supporter population. In addition, the cross-sectional design and voluntary nature of share acquisition prevent causal interpretation of the observed relationships between fan shareholding and supporter behaviors.

While the current study offers valuable insights into how formal ownership, PO, and TI are associated at a specific point in time, prior research shows that TI is a key determinant of fans' investment decisions (Kościółek, 2023; Huth, 2020; Wicker *et al.*, 2016), suggesting that supporters who became shareholders were already more strongly attached to the club before acquiring shares. Consequently, the present study cannot distinguish whether becoming a shareholder increases subsequent match attendance or whether supporters who already attend matches more frequently are simply more likely to become shareholders. Accordingly, the associations observed in this study should not be interpreted as evidence that fan shareholding itself causes subsequent behavioral change. Rather, they indicate differences associated with shareholder status after accounting for the psychological constructs included in the model. Although the IPTW robustness analysis reduced observable differences between shareholders and non-shareholders and yielded substantively similar conclusions, unobserved confounding cannot be ruled out in a cross-sectional observational design. Disentangling these dynamics requires longitudinal or experimental designs that track changes in psychological attachment and behavior before and after share acquisition. Future studies should also collect a broader set of pre-investment characteristics, such as prior match attendance, length of fandom, income, education, and season-ticket status, to better account for self-selection into shareholding and further strengthen causal inference.

A second limitation concerns the measurement of behavioral outcomes. Match attendance and word-of-mouth were assessed using respondents' self-reports rather than objective behavioral records, making the findings potentially susceptible to recall bias and social desirability. Because both the explanatory variables and behavioral outcomes were collected using the same survey instrument, common-method bias cannot be ruled out. Future research could complement survey-based measures with objective attendance records or digital behavioral data where available.

A third limitation is that our analysis is based on a single case study involving a club that issued non-tradable shares via equity crowdfunding. While this approach allowed us to examine ownership and identification in a real-world setting, this restricts the generalizability of our findings to other forms of fan formal ownership. Moreover, because no reliable population benchmark is available regarding the proportion of Wisła Kraków supporters who are shareholders, we cannot assess the representativeness of shareholder participation in our sample. Future studies should examine whether similar patterns hold in contexts where shares are freely tradable, allowing comparative analysis across ownership structures. Comparative research across different forms of supporter involvement, including equity crowdfunding, supporter trusts, member-owned clubs, fan tokens, and publicly listed clubs, would further clarify whether the bounded behavioral relevance observed here is specific to fragmented shareholder ownership or generalizes across alternative ownership and governance arrangements.

Data availability statement

The data and Stata code supporting the findings of this study are available from the corresponding author upon reasonable request.

Supplementary material

The supplementary material for this article can be found online

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