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Choosing Your Sports Partners: Assessing Selection Preferences Through Observational and Experimental Studies

Rob Franken , Hidde Bekhuis , and Jochem Tolksma 

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ABSTRACT

Previous research has demonstrated the positive impact of doing sports together on maintaining physical activity levels. Yet, there remains a gap in understanding the selection processes leading to sports partnerships. We address this question using a two-study design. Study 1 examines longitudinal ego-network data; we analyze data of 1,222 sports partnerships among 409 Dutch university students. We find that emotional closeness, rather than skill similarity, is a key determinant of sports partnership continuation over time. We do not find that the sports setting in which sports partnerships are embedded (i.e. sports clubs, informal groups, commercial gyms, unorganized settings) affect the stability of sports partnerships. Study 2 employs a discrete choice experiment, in which individuals are tasked to choose a sports partner out of choice-sets consisting of three sports partners who vary in the types of motivations and resources they offer (i.e. social comparison, knowledge, companionship, encouragement). People express a strong preference for sports partners who emphasize social aspects of sports, but as individuals become more active, sports partners who emphasize social comparison and who are knowledgeable about sports gain attractiveness. We discuss the implications of these findings for tailored strategies leveraging social networks to promote sports participation.

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Conjoint experiment; social networks; sports; sports partners

Sports are often socially structured, with social connections and encounters playing a crucial role in driving participation (Eime et al., 2008). This applies not only to team sports, but also to individualistic sports activities like running (Franken et al., 2023a) and fitness (Whiteman-Sandland et al., 2018). Studies indicate that meeting and socializing with friends form important motives for participation (Crane & Temple, 2015) and that sports partnerships can positively impact participation rates (Franken et al., 2022). Social relations in sports have further been argued to bolster social capital, through volunteering, helping and civic involvement (Putnam, 2000; Schüttoff et al., 2018).

Despite the convincing research on the benefits of social relations in sports, a notable gap remains in understanding the processes through which social relations in sports develop (Dalen & Seippel, 2021). These so-called selection processes are crucial, as they frame the scope of an individual's exposure to positive social influence and other social resources (Centola & van de Rijt, 2015). Our everyday social environments provide opportunities to establish valuable sports partnerships, yet the benefits of such partnerships rely on individuals actively choosing to join up for sports and maintain their involvement over time.

Sporting together helps individuals in keeping active. Therefore, a key question for policymakers and sports professionals is how to effectively promote collaborative sports participation. Consequently, this paper delves into people's decision-making when choosing others to do sports activities with. We aim to answer the following question: *Who do people choose as their sports partners?*

The present studies

In this paper, we discuss two studies to answer this question. Understanding how people can be encouraged to take part in sports together begins with investigating the dynamics of real-life sporting networks. Within these networks, some sports partnerships persist while others dissolve over time. Therefore, in Study 1, we leverage longitudinal data on social networks, of Dutch university students. We focus on the ego-network, comprising an individual (ego) and their most important sports partners (alters). We investigate the characteristics of the ego-alter combination (i.e., dyad) contributing to sports partnerships maintenance.

Sports partners can offer a range of informational and motivational support. This includes engaging in social comparison (Diel, Broeker, et al., 2021), offering knowledge about training and technique (Sheridan et al., 2014), providing companionship (Ullrich-French & Smith, 2009), and offering verbal encouragement (Sahli et al., 2020). To effectively get people to take up sports together, it is crucial to understand the motivations and resources sought in sports partners. This can inform the potential of different social network-based behavior change strategies, such as emphasizing competition, social enjoyment, or knowledge exchange. Therefore, Study 2 involves a discrete choice experiment (DCE). In our DCE, conducted within a large-sample Dutch survey, respondents were presented with sets of hypothetical sports partners. These partners varied experimentally in the types of informational and motivational resources they offered. Respondents then

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chose the one they preferred for engaging in shared sporting activities.

We contribute to the literature in several ways. Although social network analysis is gaining prominence in sports research (Wäsche et al., 2017), our Study 1 advances prior research (Dalen & Seippel, 2021) by using dynamic data on students' social sporting networks and rich information on dyad characteristics. Study 2 provides unique information about individuals' preferences regarding social motivations from sports partners. Our choice experiment complements our observational study in three ways. First, our choice experiment controls the opportunity structures for sports partnerships at the outset, enabling the isolation of selection preferences. Second, our choice approach mitigates common challenges associated with observational ego-network data. This includes idiosyncrasies regarding the direction of relationship change (i.e., originating with the ego, the alter or through coordinated agency) and temporal order (i.e., whether sports partnership attributes are the cause or consequence of relationship change). Third, since our methodology uses fictive choice-scenarios, we are not limited to explore attraction toward sports partner traits solely among currently active individuals. We can include individuals currently inactive, enabling us to explore how the potential of social networks may be different in drawing individuals into shared sports activities versus keeping them engaged. Given the gendered nature of sports (Theberge, 2000), we will also explore how preferences for sports partner traits vary across the genders.

To answer our research question, we will first present theoretical ideas about determinants of social relations in sports, leading to the formulation of testable hypotheses. Next, we will elaborate on the data, methods and results of Study 1, followed by a similar description of Study 2. In concluding this paper, we will theoretically reflect on our findings, and discuss the implications for initiatives aimed at promoting sports participation.

Theoretical expectations

The objective of Study 1 is to identify the factors that influence the probability that sports partnerships in students' sporting networks are maintained over time. We will introduce three mechanisms.

First, doing sports together and developing sports partnerships likely primarily revolves around the sporting activity itself. Hence, when deciding whom to engage in sports activities with, the attributes of the dyad that are instrumental to the sporting endeavor are likely to play a role. We expect that shared sports activities are more gratifying if individuals (ego and alter) are more similar in their sporting skills and performances. This similarity leads to smoother coordination during sports activities, as skill and performance differentials could make it difficult for one individual to keep up with the other. Sports psychology research shows that athletes tend to compare their abilities and performance to that of sports partners, and that the (perceived) standing of comparison targets impacts individuals' motivation and performance (Diel, Grelle, et al., 2021). Especially effective in enhancing motivation are social comparisons against attainable standards (Diel, Broeker, et al., 2021). This means having sports partners

whose performance and skill are neither out of reach nor already achieved. Extreme skill gaps, on the other hand, may lead to declining motivation and increasing tendencies of disengagement.

Secondly, we know that sports and shared participation are not only about being physically active and the sport itself, but also about meaningful social interactions. According to the social production function theory (Lindenberg, 1996), people strive for both physical and social wellbeing. Beyond physical benefits, derived through the stimulus and activity provided, doing sports together fosters social wellbeing through social aspects. It helps develop shared values and norms (Eccles & Barber, 1999), refines social identity (Barber et al., 2005), and creates affection through feelings of friendship (Fujimoto et al., 2018). This shows that sports have important social functions. From this perspective, individuals likely tend to pursue sports partnerships primarily with alters to whom they are emotionally close, as it is particularly these close alters who can contribute to the social "needs" of sports.

Last, social network research shows that social relations often originate in larger extra-network social structures (Feld, 1981). This is no different in the context of sports. Sports partnerships are often formed and nurtured within sports clubs, commercial gyms, or in informal group settings (Borgers et al., 2016). These social contexts can be seen as foci around which people organize their shared sports activities. A notable difference between different types of social sporting contexts lies in their level of "heaviness" or demands (Scheerder & Seghers, 2016). Club-sports, characterized by formal organizational structures, facilities, and their rules and expectations can be considered "heavy." Informal group activities or shared gym sessions, on the other hand, can be seen as "light" sporting contexts. The visible and formalized structures of club-sport settings likely promote routine and commitment (Giddens, 1984), due to formalized (long term) membership agreements, scheduled training sessions, and dependence on sports facilities. This may not only positively affect patterns of involvement (Borgers et al., 2016) but also result in more stable sporting relations. In contrast, participation in informal or light sports settings may coincide with more fluctuation in participation patterns and churn in sports partnerships.

Based on the previous, we can formulate the following hypotheses:

H1: Sports partnerships are less likely to be maintained when skill differences between ego and alter are larger.

H2: Sports partnerships are more likely to be maintained when ego and alter are emotionally closer.

H3: Sports partnerships are more likely to be maintained in club-organized than in non-club-organized sports settings.

Previous experimental research has shown that tie formation in (online) health networks is unaffected by sports or fitness characteristics of dyads but is instead driven by selection based on familiar demographics (Centola & van de Rijt, 2015). Using unique dynamic data on sports partnerships, Study 1 enables us to test whether selection patterns in naturalistic networks, rather than experimental networks, depend on sports

characteristics of the dyad (H1) and/or familiarity and emotional connection (H2). Despite the numerous positive outcomes associated with sports club membership (Eime et al., 2010) and the argument that clubs act as “social glue” binding communities (Putnam, 2000), it remains unexplored how club membership relates to the stability of sports partnerships (H3).

Using Study 2, we mitigate the notorious challenge of discerning preferences within observational social network data by employing a conjoint experiment, which controls for opportunities at the outset. Using this methodology, we are not limited to studying preferences for individuals currently active in sports but also for those currently inactive. We will tease out individuals’ selection preferences for different types of resources their (potential) sports partners may offer and investigate how these preferences vary according to individuals’ activity level and gender.

Sports partners may provide various types of social motivation. They may be more focused on the social aspects of sports, for instance when sports partners produce companionship and encourage each other. Other motivations are more instrumental to performance and competence, such as when sports partners stress performance comparison or compete, or when they provide knowledge on the right training and technique. We expect that individuals currently not engaged in sports activities are especially likely to be drawn into sports by alters who emphasize the social aspect and enjoyment of the activity. As individuals become more involved and accumulate experience, their motivation for engaging in sports may shift toward pursuing success and improving their skills (Pereira et al., 2021). This would lead them to become less oriented toward doing sports with others who emphasize the social aspects of sports, and instead seek sports partners who are capable of providing motivational resources to aid their progress, such as guidance on training methods and techniques, along with competitive challenge. Additionally, sports performance may be an important social status determinant in a sports context (Gadžić & Vučković, 2009). This makes individuals who are more experienced in sports more prone to social comparisons as a means to expressing their social status.

Literature from sports psychology suggests that male and female athletes differ in their sports motivation. Whereas female athletes are more often driven by social motives, such as affiliation, male athletes more often report to be driven by achievement and competition (Deaner et al., 2016; Pereira et al., 2021). This may be attributed, in part, to the greater importance of sports performance in determining social status in men compared to women (Chase & Dummer, 1993). Despite previous research indicating gender differences in sports motivations, it has not been assessed whether this translates into varying selection preferences for sports partners among men and women.

Based on this, we formulate a second set of hypotheses which we will be able to test in Study 2:

H4: Encouragement and companionship are less attractive sports partner motivations for individuals currently (more) active in sports.

H5: Social comparison and knowledge are more attractive sports partner motivations for individuals currently (more) active in sports.

H6: Encouragement and companionship are more attractive sports partner motivations for women compared to men.

H7: Social comparison and knowledge are more attractive sports partner motivations for men compared to women.

Study 1

Data

For Study 1, we use waves 1–3 of the “Sports and Friendships” study (Franken et al., 2023b). This is a longitudinal panel dataset of ego-networks of Dutch university students, collected during the academic year 2022–2023. Our surveys included multiple repeated name generator questions to tap into different types of social relations students have. Most importantly for this study, students were asked about their most important sports partners. We also measured other salient social relations: friends, confidants and study partners. Details about our data collection procedure and our approach to measuring social networks can be found in [Appendix A](#).

In total, our working sample consists of 1,222 unique sports partnerships of 409 egos, which we observed 1,426 times. Note that our sample excludes family relations, amounting to less than 7% of all sports partnerships in our data. Descriptive statistics of egos and their sports partners are presented in [Appendix A](#). Access to our datasets and replication of our analyses is possible using our replication website: <https://sportspartners.netlify.app/>.

Measures

Dependent variable: Sports partnership

Our dependent variable is a binary indicator of whether a sports partnership of ego at time t is maintained at $t+1$ (1=yes, 0=no).

Main predictors

We included several predictors of sports partnership maintenance at time t . We measured sports-related attributes of ego and sports partners. In wave 1 (September 2022), respondents were prompted to choose from a list of 14 types of sports activities (fitness, running, football, ...), the activities they had engaged in over the past year. In order to provide a comprehensive overview, respondents were also given the opportunity to specify up to three additional sports types. Respondents were then asked about the social sporting environment in which they predominantly participated in these sports types: as a member of “a sports club,” “a commercial gym,” “an informal group setting” or “alone, unorganized.” Additionally, for each activity selected, respondents were asked to indicate their frequency of participation. Categories ranged from “less than once a month” to “7 times per week or more

often.” They were further asked to rate their skill level on a 10-point scale. Subsequently, respondents were asked which of the reported sports types they did most often together with each of the listed sports partners. They then estimated the frequency of participation and skill level of their sports partners in the assigned sports type.

In wave 2 (January 2023), respondents were asked whether they participated in the sports types reported at wave 1 over the past semester. They could once more specify three additional sports types. For each activity selected, respondents were again asked to indicate their frequency of participation and skill level. They also reported on their sports partners frequency of participation and skill level.

Firstly, we are interested in the impact of skill differences between ego and alter on the persistence of sports partnerships. To measure *ego-alter skill* difference, we computed the absolute difference between the skill level of ego and alter ($M = 1.25$, $SD = 1.18$). This measure was included in our models along with ego’s skill level ($M = 6.80$, $SE = 1.45$) to predict sports partnership maintenance.

Secondly, we included dummies to measure the *social sports environment* in which ego and the sports partner participate in sports (i.e., sports club, commercial gym, informal group, unorganized; 1=yes, 0=no). In wave 2, although social sporting contexts were not measured, it was assumed that the sports activities ego continued to participate in from wave 1 remained within the same context. The social sporting context of new types of sports activities listed in wave 2 were coded as missing.

Lastly, we measured the *emotional closeness* of the dyad by asking respondents how close they were to each alter at t . This measure ranged from 1 (not close) – 4 (very close).

Control variables

Within our models, we account for various explanations for the maintenance or dissolution of sports partnerships. At the dyad-level, we took into account traditional explanations for tie dissolution (Marin & Hampton, 2019). We controlled for *relationship duration* (in years), as sports partnerships may be more likely to be endured when individuals have known each other for longer time. We also included *communication frequency*, ranging from 1 (“never”) – 7 (“almost every day”). We included *geographical proximity*, dummy-coded as (1) “same house”, (2) “same municipality,” and (3) “different municipality,” as the maintenance of sports partnerships requires (physical) meeting opportunities. We included dummies reflecting the *gender composition* of the dyad, with the combinations man-man, woman-woman, and man-woman (serving as the reference category), expecting same-gender partnerships to be more stable. We also controlled for the other social roles sports partners may have at time t : *best friend, confidant, and/or study partner* (1=yes, 0=no). To address the possibility of sports partnerships ending due to ego having *replacement candidates*, we controlled for the number of other sports partners at time t engaging in the same activity type as ego and the particular sports partner. We also controlled for the *sports frequency of the dyad*, by taking the average of the weekly participation of

ego and alter in their shared activity type at t , because the continuation of sports partnerships depend on whether continued opportunities for shared sports activities are produced by ego and alter. Finally, we incorporated *observation periods* into our analyses, to address potential period-specific effects, or variations in sports partnership maintenance between waves 1–2 (coded 0) and waves 2–3 (coded 1).

Analytical strategy

We use logit models to model our dichotomous variable reflecting whether sports partnerships are maintained at $t + 1$. To account for the nesting structure of our data, we use a multilevel logit model. This takes into account the interdependency of sports partners reported by the same ego (Snijders & Bosker, 2012). The period of measurement (between wave 1–2 or between waves 2–3) was included as a fixed-effect. Random slopes for our main predictors were excluded due to their minimal variance. A likelihood ratio test showed their inclusion did not enhance model fit.

We computed average marginal effects (AME), which represent the average change of the probability that a sports partnership is maintained, for a one-unit change in the explanatory variable of interest. For reasons of parsimony, in the main text we only show results with respect to the average marginal effects of our main predictors. A more complete overview of AMEs of all control variables, as well as the underlying multilevel logit model results, can be found in Appendix B. For AMEs, we report the bootstrap generated 95% confidence intervals (Tolsma, 2023).

Results

Who stays our sports partner?

Figure 1 shows the average marginal effects (AME) on the maintenance of sports partnerships. We expected sports partnerships with large skill gaps to be less likely to endure due to difficulties in coordinating sports activities (H1). However, our findings do not support this: partnerships characterized by higher skill differences do not face a greater risk of dissolution.

Instead of individuals’ sporting skills, a key determinant of sports partnership maintenance is emotional closeness. Sports partnerships characterized by greater emotional closeness are more likely to persist (AME = 0.053, SE = 0.021), in line with our expectation. This effect is substantial: on average across all respondents in our dataset, a one-point increase on the 4-point emotional closeness scale drives a 5% point increase in the probability of sports partnership maintenance.

Finally, against our expectations, we do not find that sports partnerships in club-organized settings are more stable than are relations in different sporting settings. If anything, doing sports together in (commercial) gyms enhances the longevity of sports partnerships (see Appendix B, Table B1), but this becomes insignificant after including dyad-level control variables.¹

¹In additional analyses, we used “unorganized” as the reference category to examine how the stability of sports partnerships in various institutional settings compares to the absence of a formal setting. However, no significant differences were found.

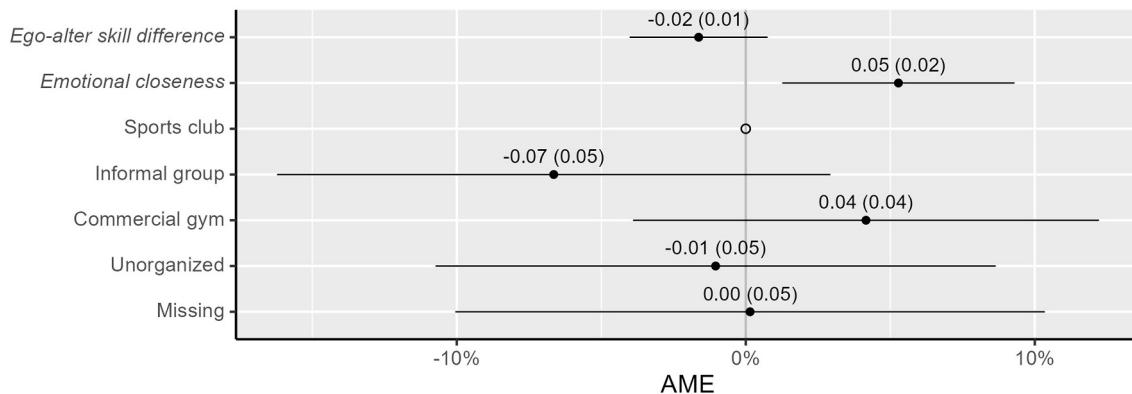


Figure 1. Average marginal effects on the maintenance of sports partnerships at $t+1$. Notes: Average marginal effects (AME) represent the average change of the probability that the outcome equals 1 (i.e., a sports partner is maintained) for a one-unit change in the explanatory variable of interest. For dichotomous variables, we compare a change in predicted value between the reference category (denoted by the unfilled point on the zero line) and the category of interest. For continuous variables (indicated in italics), we take the partial derivative. We took both fixed and random effects into account when calculating predicted outcomes. Effects are transformed to percentages. Error bars reflect 95% bootstrapped ($N=500$) confidence intervals. AMEs of control variables and the underlying logistic regression results are presented in Appendix B.

Robustness check: Do patterns depend on the type of sport activity?

Students reported engaging in multiple sports activities, often with different sports partners. Potentially, the observed (de-) selection patterns vary depending on the specific type of sport performed by ego and alter. Fitness stands out as the most popular (shared) activity, accounting for 27% of all sports partnership observations. Estimating our model on this subset of fitness partners, or on our sample after excluding these fitness partnerships, did not yield different results (see our replication website).

Study 2

The findings from Study 1 show that sports partnerships are less driven by dyadic skill levels, which were initially expected to be instrumental to effective collaboration in sports. Instead, the driving force behind these partnerships appears to be the social aspects, represented by the emotional closeness between ego and alter. Our discrete choice experiment in Study 2 enables us to further test this idea. The hypothetical nature of our choice design controls for the meeting opportunities required for sports partnerships, enabling us to isolate selection preferences, based on “soft” attributes that are challenging to measure in observational studies.

In our discrete choice experiment, respondents were asked to imagine a situation in which they had to choose a sports partner to join up with. They were then asked to choose one sports partner out of three alternatives, presented simultaneously to them within a so-called choice-set. In these choice-set, the features of alternatives vary experimentally in their levels, with each alternative describing a sports partner based on four types of social motivations or resources offered.

Data

We conducted our choice experiment among members of the large sample I&O Research panel in October 2022 (I&O Research, n.d.). This is a probability-based online panel of

people in the Netherlands. Young parents and starters in the labor market were recruited for the survey project “Transition into Active Living” (TRIAL) in October 2021 (wave 1) and October 2022 (wave 2) (Steenbergen et al., 2019). In wave 1, respondents were asked to reflect on their sports and physical activity at different points in their life. In wave 2, we again asked questions about sports activity, and conducted the choice experiment. Our working sample consists of 3,206 panel members who completed wave 2 and participated in the choice experiment. More information about the data collection and response rates, as well as statistics of key variables describing our sample, can be found in Appendix C.

Design

In our discrete choice experiment, respondents choose one option out of three alternatives presented simultaneously to them within a choice-set. In these choice-sets, the attributes of alternatives vary experimentally in their levels. Choice sets are then randomly allocated to respondents. We constructed the full factorial design containing ($3^4 =$ 81 standardized alternatives. Each alternative described a sports partner based on four types of motivation offered (features) that varied experimentally in three levels. Choice-sets were constructed by sampling three alternatives from the full factorial design without replacement. We constructed three choice-sets per respondent. The order of the features in choice-sets varied randomly between respondents, hence we avoided order effects. Each scenario was presented on a separate page. Respondents could not skip a choice task. Figure 2 shows an exemplary choice-set of a fictive respondent.

Measures

We included sports partner features that reflect the social motivations or resources sports partners could offer. These features included the degree to which the partner likes to compare sports performances (Comparison), their level of

Some people prefer to do sports alone, while others enjoy participating with others.

Imagine you have played sports with the people described below.

If you had to choose, **who would you want to play sports with again?**

	PERSON 1	PERSON 2	PERSON 3
<i>Comparing sports performance</i>	really likes to compare sports performances	does not like to compare sports performances	somewhat likes to compare sports performances
<i>Knowledge about training and technique</i>	knows less than you about effective training and the right technique	knows less than you about effective training and the right technique	knows more than you about effective training and the right technique
<i>Companionship</i>	exercises to socially engage	wants a combination of social interaction and purposeful training	exercises purposefully and seriously
<i>Encouragement</i>	never encourages you	sometimes encourages you	sometimes encourages you

PERSON 1 PERSON 2 PERSON 3

Figure 2. Screenshot of the CAPI interface of the survey experiment used by a hypothetical respondent. Note: The description was freely translated from Dutch.

knowledge about training and technique (Knowledge), the frequency of verbal encouragement (Encouragement), and whether their participation is for serious training or for social interaction and fun (Companionship). Thus, we distinguished between sport interactions that emphasize the social enjoyment of sports (i.e., encouragement and companionship) and sport interactions that are more instrumental to performance and competence (i.e., comparison and knowledge). Each attribute was given three levels (see Table 1): positive (+), neutral (\pm), and negative (-).

The objective of our study was to investigate whether sport interactions emphasizing social enjoyment hold greater appeal compared to those focused on performance. Additionally, we aimed to investigate the degree to which preferences for diverse sports partner motivations differed based on individuals' current activity level and gender.

During wave 2, we assessed respondents' current involvement in sports by asking them whether they had participated in any sports activities within the last month. They were given the option to list up to three types of

sports activities. To measure their *current participation*, we differentiated between those who indicated no participation in sports (coded as 0) and those who confirmed participation (coded as 1). To capture a finer understanding of individuals' participation, we additionally measured the frequency of sports participation. For each listed sports activity, respondents were asked about their frequency of engagement in that specific activity type during the previous month, with options ranging from 1 (1–3 times per month) to 4 (on a daily basis). We aggregated the weekly sports sessions for each activity, resulting in a cumulative score ranging from 0.5 to 14. For parsimony's sake, we differentiated between those participating in sports 3 times per week or more (coded 1; 48% of respondents) and those participating less than 3 times per week (coded 0), to measure *frequent participation*. We checked whether different thresholds for high and low frequency of participation (e.g., > 3 vs. ≤ 3) affected our results, but this was not the case (see our replication website).

Table 1. Features and levels of the sports partner discrete choice experiment.

Sports partner feature	Levels
A1.Social comparison	L1.Really likes to compare sports performances (+) L2.Somewhat likes to compare sports performances (\pm) L3.Does not like to compare sports performances (-)
A2.Knowledge about training and technique	L1.Knows more than you about effective training and the right technique (+) L2.Knows as much as you about effective training and the right technique (\pm) L3.Knows less than you about effective training and the right technique (-)
A3.Companionship	L1.Exercises to socially engage (+) L2.Wants a combination of social interaction and purposeful training (\pm) L3.Exercises purposefully and seriously (-)
A4.Encouragement	L1.Always encourages you (+) L2.Sometimes encourages you (\pm) L3.Never encourages you (-).

Lastly, we assessed respondents' gender, categorized as male (coded as 1) or female (coded as 0). Those who indicated a different gender were excluded from our analyses due to their small number.

Analytical strategy

Respondents evaluated 3 choice-sets consisting of 3 fictive sports partners. The outcome variable is dichotomous (taking on value of 1 if a given profile is chosen and 0 otherwise). We describe respondent preferences for sports partners by computing marginal means. In the context of a completely balanced conjoint experiment like ours, marginal means represent the mean choice outcome across all appearances of a particular sports partner feature level, averaging across all other features. Since respondents were presented with 3 alternatives, the grand mean is by definition about 0.33 (i.e., 33% of all profiles shown is chosen). We therefore subtract this baseline probability from the marginal mean, such that scores above (below) zero indicate feature levels that increase (decrease) profile attractiveness.

We present marginal means instead of the often-reported average marginal component effects (AMCE) (Hainmueller et al., 2014), in order to delve into interactions or subgroup preferences for sports partners. The interpretation of subgroup preferences using conditional AMCEs can be misleading as regression interactions are sensitive to the (arbitrarily) chosen reference category (Leeper et al., 2020). In our balanced design, AMCEs simply represent the difference between the marginal mean of a feature level and that of its reference level (for AMCEs, see our replication website).

To explore to what extent preferences for sports partner features differ across subgroups (e.g., men vs. women), we calculate conditional marginal means, which indicate the percentage point deviation from the grand mean for each subgroup. We then take the difference in these conditional marginal means between the two subgroups. To formally test whether preferences for specific sports partner motivations are

heterogenous across subgroups, we estimate a linear probability model with interaction terms between the subgrouping variable and the particular feature (levels). A nested model comparison between this equation and an equation without such interactions provides an F-test of the null hypothesis that all interaction terms are equal to zero (Leeper et al., 2020).

Results

Figure 3 shows the marginal means (MM). In general, we observe a preference among respondents for sports partners who place an appropriate amount of emphasis on social comparison—not too much, not too little. Ideal partners are knowledgeable about effective training and the right techniques, equaling or surpassing the respondents' own knowledge level. Respondents favor sports partners who combine social engagement with purposeful training, yet they favor those who prioritize social engagement over those who exercise solely seriously. Finally, regular encouragement from sports partners is highly valued.

Do sports partner preferences depend on an individual's activity level?

Figure 4 shows the conditional marginal means (CMM) across different subgroups. The first column shows the conditional marginal means for respondents currently active (blue) and respondents currently inactive (orange). The second column breaks down the marginal means further based on whether currently active respondents reported a high (≥ 3 times per week; blue) or low (< 3 times per week; orange) frequency of sports participation. The difference-in-CMMs are displayed in black.

Inactive individuals exhibit a stronger attraction to sports partners who dislike comparing sports performances, and a stronger aversion to sports partners who really like comparing, when compared to active individuals ($F(3, 3.60) = 5.46, p < .001$). Likewise, the attraction (aversion) to sports partners who dislike

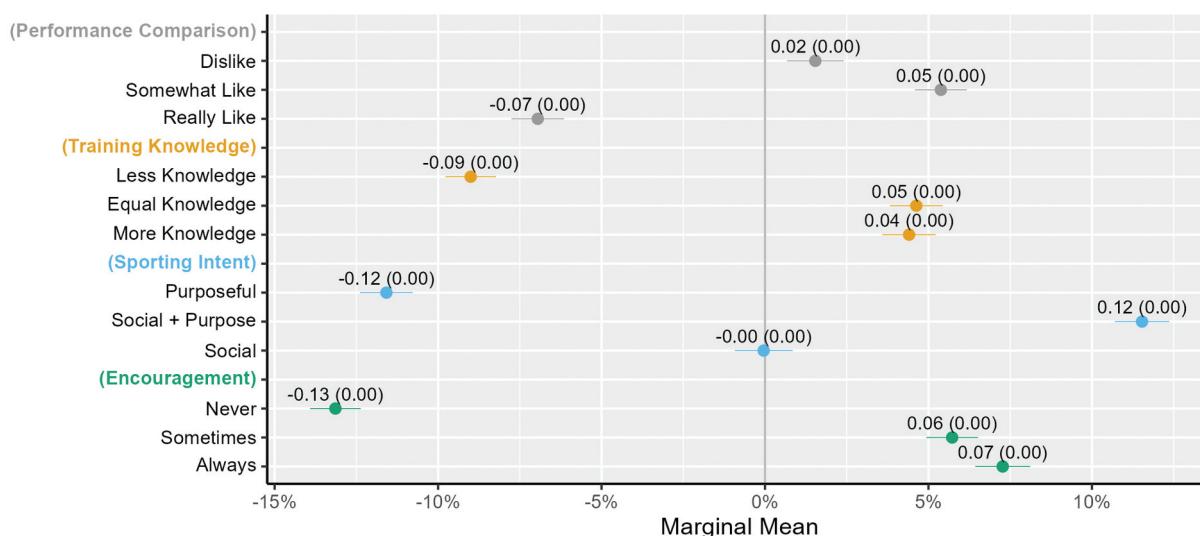


Figure 3. Marginal means. Marginal means reflect the percentage point deviation from the baseline probability of 0.33 for choosing sports partners with specific feature levels. Bars represent 95% confidence intervals, calculated via OLS regression with clustered standard errors.

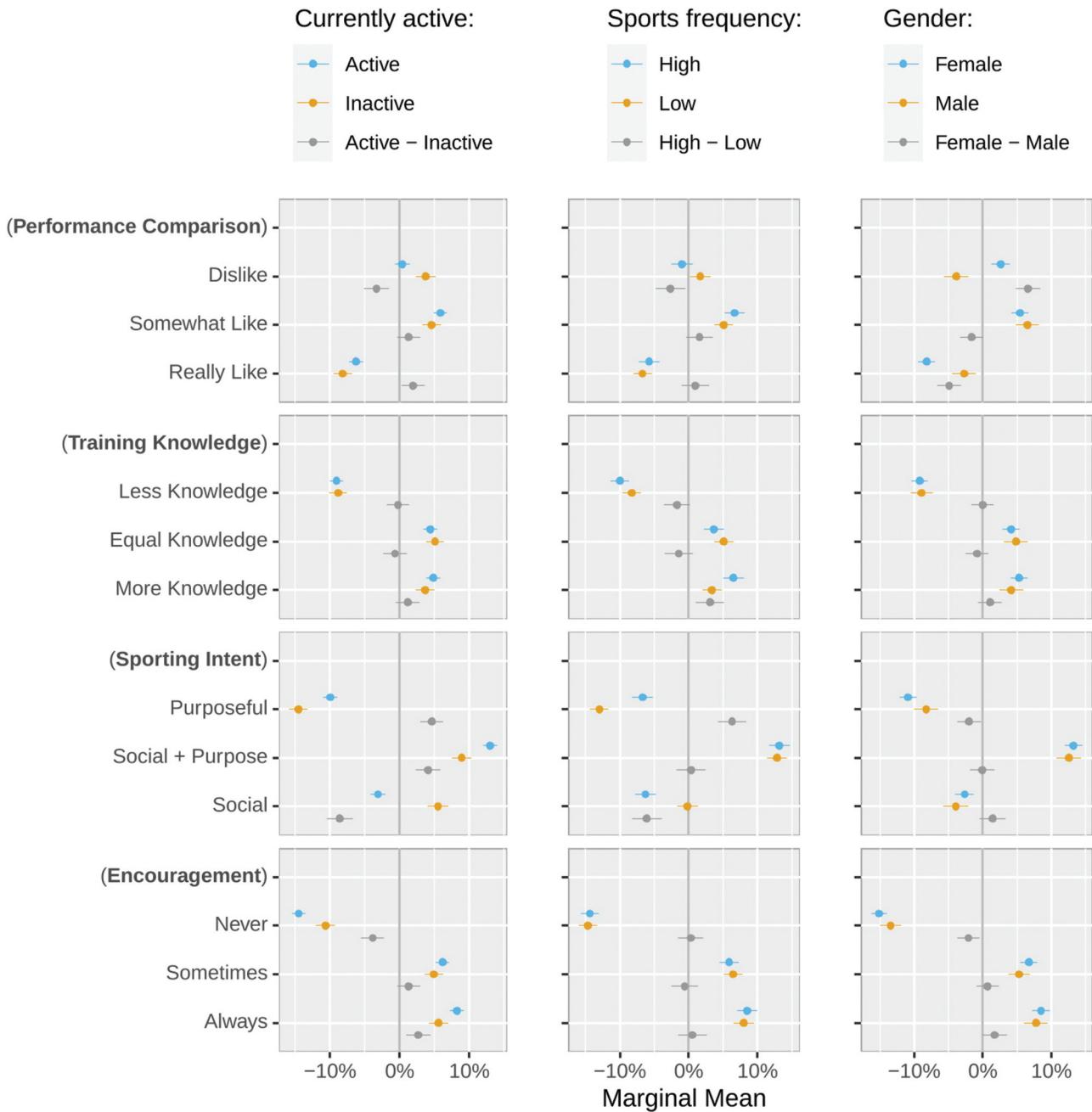


Figure 4. Conditional marginal means. Conditional marginal means are computed for subgroups (blue/yellow), and the difference between these conditional marginal means (black) are calculated.

(really like) social comparison decreases once one becomes more active in sports ($F(3, 1.61) = 2.44, p < .10$).

Levels of favorability to knowledgeable sports partners do not differ based on whether individuals are currently active or not ($F(3, 0.42) = 0.64, p < .59$). However, highly active sporters are attracted to a greater degree to sports partners who know more than themselves about training and technique than their less active counterparts ($F(3, 2.26) = 3.46, p < .05$).

The most notable difference between active versus inactive people and between those with high versus low sports frequency lies in their level of attraction to emphasis on social engagement versus purposeful training. While everyone seems to prefer sports partners who combine both

aspects, inactive people show a stronger attraction (aversion) to those emphasizing social enjoyment (purposeful training) than do active people ($F(3, 24.64) = 38.65, p < .001$). The same holds for people with a low sports frequency compared to those with a high sports frequency ($F(3, 11.89) = 18.66, p < .001$).

Last, we observe that individuals currently active are more strongly attracted to sports partners who encourage them more frequently than are inactive individuals ($F(3, 5.18) = 8.10, p < .001$). However, this does not hold for individuals with higher frequency of sports participation compared to those with lower frequency ($F(3, 0.11) = 0.17, p < .92$).

Do sports partner preferences depend on an individual's activity level?

Finally, the last column of Figure 4 shows the conditional marginal means for men and women. We observe that men and women are much alike in their preferences for sports partners. The one notable difference is that women exhibit greater attraction (aversion) to sports partners who dislike (really like) social comparison, compared to men ($F(3, 10.26) = 15.60, p < .001$). We do not find that women are attracted to a greater degree than men to sports partners who emphasize social engagement ($F(3, 1.29) = 2.01, p < .12$). Men and women do not display differential levels of favorability toward other sports partner features.

Discussion and conclusion

Engaging in sports together clearly contributes to maintaining an active lifestyle. Thus, a crucial question arises for policymakers and sports professionals: how can we effectively encourage people to participate in sports together? Yet, currently, there remains a lack of research on selection processes leading to sports partnerships.

To address this gap, we investigated the social and instrumental factors in maintaining sports partnerships. Our unique design, combining longitudinal sporting network data and sports partner choice experiments, robustly shows that social aspects are the most important in encouraging continued sports partnerships. In real-life sporting networks, those who are emotionally closest remain sports partners, not those with similar skills. And when individuals are faced with hypothetical sports partners, they prefer those who provide companionship and encouragement over those offering knowledge and social comparison. These patterns were consistent across various sports activities. This underscores the idea that sports serve as important social arenas wherein people gravitate toward participation with their closest friends. These individuals have the unique ability to transform sports activities from a mere physical activity into a social experience.

Our choice experiment not only clarified findings from our observational network data but also allowed us to explore whether sports partners have different motivational roles in attracting and retaining people in sports—a crucial inquiry in sports promotion research (Marcus et al., 2000).

While even seasoned athletes found companionship derived from sports partnerships very important, this was even more pronounced among those currently inactive or only moderately active. Verbal encouragement appeared highly appealing for respondents, regardless of their frequency of sports participation, albeit to a lesser extent among currently inactive individuals compared to their active counterparts. While the effect of encouragement on sports partner choice remained substantial among those currently inactive, it is possible that its smaller effect is due to currently inactive individuals not fully grasping the motivational impact verbal encouragement can have on them. Alternatively, they may sometimes perceive verbal encouragement as nagging or patronizing (Duncan & McAuley, 1993).

We expected the motivational role of sports partners to change as individuals become more active and experienced.

Consistent with this, we found that social comparison and knowledge about training and technique—resources instrumental to performance improvement—become increasingly desirable sports partner traits as individuals become more active.

Our findings contribute to several strands of literature. First, we echo prior research on the role of health and fitness status in tie formation in social networks. Previous studies have shown that similarity in health status has virtually no effect on tie formation (Copeland et al., 2023), nor does similarity in fitness, even in online fitness communities (Centola & van de Rijt, 2015)—online contexts where people are particularly expected to seek out others based on their fitness status. These studies demonstrate that, instead, similar demographics, which may indicate trustworthiness, identification, and mutual understanding, are the primary drivers of tie formation. Our analyses add that fitness status also has no effect on the maintenance of social ties in sports.

Second, sports psychological studies on social comparisons indicate that athletes avoid social comparisons against unattainable standards (Diel, Broeker, et al., 2021). Our findings echo this but add an important nuance: large skills gaps—which could potentially trigger such demotivational comparisons—do not matter on their own (Study 1) unless emphasized through social comparisons (Study 2).

Third, research on gender differences in sports motivation shows that men and women tend to have different motivations for being active in sports. Women's involvement in sports is less driven by competition and social comparison compared to men's (Deaner et al., 2016; Pereira et al., 2021). Women have also been found to be more self-critical about their bodies and experience more pronounced negative impacts of social comparisons on their self-esteem compared to men (Franzoi et al., 2012). Our findings contribute to the literature by highlighting how the gender disparities in sports motives and comparison tendencies can lead to differential selection preferences when choosing sports partners.

We found that sports clubs, despite motivating people to keep active (e.g., Franken et al., 2022) and providing other benefits (e.g., quality training), do not promote more durable sports partnerships compared to less formalized sports settings. Therefore, sports clubs do not act as “social glue” driving sustainable sports collaborations, and this is not an additional mechanism through which sports clubs promote continued sports participation. In the traditional club sports context of the Netherlands, which is similar to many Northern European countries, sports clubs are typically voluntary, organized member associations that focus primarily on competitions and offer training sessions tailored accordingly. While this competitive environment can be motivating for some participants, our findings suggest that it is not appealing for many. This holds especially for those who are currently not involved in sports. To attract new members, sports clubs might therefore benefit from offering a more diverse range of physical and social activities. Additionally, even among those who are currently active in sports, there is a general aversion to social comparison. This aversion may partially explain why sports clubs fail to nurture more stable social sporting relationships compared to other settings.

The Scandinavian model of club sports can serve as a promising example (Bergsgard & Norberg, 2010). In this model, children are guided not by results and achievements until the age of sixteen but by the enjoyment of playing and having fun, avoiding division into competitive groups. Our expectation is that in Scandinavian countries people are less likely to leave clubs due to less emphasis on competition, subsequently resulting in more stable sporting relations in clubs as compared to other types of organizational settings (e.g., informal groups, gyms).

There is also growing evidence regarding barriers to participation, particularly for women, within and outside club-organized sports (Eime et al., 2015). Women are known to be less involved in club sports and face higher dropout rates. Our study suggests that the competitive focus of clubs may be an additional barrier contributing to this greater dropout.

In our models we controlled for many traditional explanations for social tie maintenance from the social network literature (see Appendix B) and consistent with previous research (e.g., Marin & Hampton, 2019), our findings underscore the importance of opportunity structures: close geographical proximity and frequent interaction between individuals are crucial for tie maintenance, also in sporting networks. Surprisingly, gender similarity did not enhance tie stability in sports partnerships, in contrast to research on other relationship types, such as discussing important matters (Jeroense et al., 2024), practical helping (Tulin et al., 2021) and friendship (van Duijn et al., 2003).

In conclusion, to encourage people to take up sports together and continue their shared involvement over time, the emphasis should be on the social aspects of participation. Sports organizations, clubs and professionals can collaborate with non-sports organizations, such as schools, neighborhood organizations, leisure clubs or students associations. This facilitates easy access to *social* sporting opportunities. Moreover, social network-based behavior change strategies should be tailored to individuals' activity levels, prioritizing social enjoyment while gradually integrating elements like social comparison and knowledge transfer as individuals become more active and experienced. However, it is crucial to also consider the gender composition of sporting contexts, recognizing that women may be less inclined toward social comparison.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Institutional review board statement

The study was approved by the Ethics Committee Social Science of Radboud University [ECSW-2021-099 (Study 1) and ECSW-LT-2022-11-30-15458 (Study 2)].

Informed consent statement

Informed consent was obtained from all subjects involved in the study.

Data availability statement

The data presented in Study 1 are openly available in DANS Data Station SSH at doi:10.17026/SS/GODKDR. While all data for Study 2 will be accessible at a later time, essential components required for replicating our conjoint analyses are provided on our replication website.

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Appendix A. Data collection, network measurement, and descriptive statistics of Study 1

Data collection

For Study 1, we used data of the Dutch “Sports and Friendships” study (Franken et al., 2023b). The overarching aim of this study was to explore the (co-) evolution of multiple dimensions of students’ social relations throughout student life and its consequences for their sports participation and academic experiences and outcomes. The study was piloted among a small cohort of first-year students ($N = 89$) enrolled at a research university or university of applied sciences of a major Dutch city in the academic year in the academic year 2021–2022. The next academic year (2022–2023), the study was refined and conducted among a large sample of university students from all year groups ($N = 655$).

We obtained student contact information from the university sports center, of students who, during their online registration, had given permission to be approached for scientific research. In our main cohort, this amounted to roughly 50% of all students who enrolled for a university sports center membership and approximately 10% of the entire student body, totaling more than 5,000 Dutch-speaking students.

Exclusions comprised participants from the pilot cohort and those who had previously opted out, yielding a list of 5,227 students. These students were sent invitations via mail for questionnaire wave 1 at the start of the academic year in September 2022. Questionnaires were delivered in Dutch and were administered via LimeSurvey (Schmitz, 2020). To increase response rates, we raffled of 10 annual subscriptions at the sports center for the next academic year. To enhance exposure, an invite was posted on the university sports center’s smartphone app, which is used for registering for sports courses and booking gym sessions. Two reminders were sent. 1,135 students filled out the questionnaire, 15 students opted out (response rate = .22).

In January 2023, after the first semester, 1,116 respondents who had listed at least one network partner in the first questionnaire were sent an invitation for a second questionnaire (wave 2). Of those, 608 respondents completed it, resulting in a response rate of .54. Respondents were given 5 Euro vouchers after completing Wave 2. In July 2023, just before the summer break, a third and last questionnaire was administered among previous participants. To promote response, we raffled of 5 annual subscriptions at the sports center. 420 respondents completed it (response rate = .38).

The questionnaires assessed various social network dimensions via multiple name generator questions, multiple attributes of alters and ego-alter dyads, dynamic measures of life-course transitions, and much more. More details on the study design and specific questions asked are documented in the codebook. The study has been approved by the Ethics Committee Social Science of Radboud University. The anonymized data used for this paper, along with the codebook, have been deposited in the DANS Data Station Social Sciences and Humanities.

In our sample, female students make up 76% of respondents (see Table A1), while among all students enrolled at the university sports center at the time our data collection started, approximately 63% were female. Our survey participants are slightly younger ($M = 21.83$, $SE = 2.36$) compared to the average student age of around 23. Students from research universities were overrepresented in our sample, which is not surprising, given that roughly 80% of students enrolled at the university sports center at the time our data collection, studied at a research university. Importantly, we do not observe selective panel attrition based on factors such as gender, educational institution type (research university vs. university of applied science), or study year.

Table A1. Descriptive statistics of egos included in study 1.

	Count	Min.	Max.	Mean	SD
Age	409	17	32	21.83	2.36
<i>Gender</i> (1=yes, 0=no)					
Man	409	0	1	0.24	
Woman	409	0	1	0.76	
<i>Education</i> (1=yes, 0=no)					
University of applied science	409	0	1	0.14	
Research university	409	0	1	0.86	
<i>Education year</i>					
First year	409	0	1	0.24	
Second year	409	0	1	0.17	
Third year or above	409	0	1	0.59	
<i>Sports variables</i>					
Sports network size (no. of sports partners)	409	1	5	3.56	1.31
Number of sports types	409	0	10	3.61	1.83
Weekly sports activity (averaged over sports types)	409	0	6	1.55	0.98
Sporting skills (averaged over sport types)	409	1	9	6.53	0.99

Measuring personal networks

The “Sports and Friendships” study used an extended egocentric name generator method to delineate respondents’ personal network and collect information about alters. It asked respondents to name the people whom they were connected to in four ways: (1) confiding or discussing important matters, (2) studying together, (3) being best friends, and (4) doing sports and exercise together. The four name generator questions administered were:

- (1) “Most people discuss important personal matters with others. When you look back on [period], who were the most important people you discussed important issues with? Please provide up to five names (their first name and the first letter of their last name). If you would like, you can also provide nicknames, as long as you know who they are for future reference. Please fill in one name per box.”
- (2) “We would also like to ask about the people you study with, such as those you collaborate with on a project or do homework with. When you think back on [period], who were the most important people you have studied with. For each person, please fill in one box.”
- (3) “We are curious about your friendships. The people you can count as your closest friends are often few and far between. Who would you count as your closest friends? You can name up to five. Please fill in one person per box.”
- (4) “Some people mainly exercise alone, while others exercise with others. If you look back on [period], who are your most important sports partners? Please provide up to five names, entering one person per box.”

In response to each name generator, respondents provided the names of up to 5 alters.

Table A2. Descriptive statistics of ego's (non-kin) sports partnerships at time *t*.

	Count	Min.	Max.	Mean	SD
<i>Geographical proximity</i>					
Same house	1,426	0	1	0.12	
Same municipality	1,426	0	1	0.70	
Outside municipality	1,426	0	1	0.18	
Communication frequency	1,426	1	7	6.04	1.04
Emotional closeness	1,426	1	4	3.00	0.93
Relationship duration (years)	1,426	0	15	3.91	3.95
<i>Relationship role</i>					
Sports partner	1,426	0	1	1.00	
Best friend	1,426	0	1	0.41	
Study partner	1,426	0	1	0.16	
Confidant	1,426	0	1	0.33	
<i>Gender composition dyad</i>					
Man-man	1,426	0	1	0.15	
Man-woman	1,426	0	1	0.27	
Woman-woman	1,426	0	1	0.58	
<i>Sports variables</i>					
Ego-alter skill difference	1426	0	9	1.25	1.18
<i>Social sports environment</i>					
Sports club	1,426	0	1	0.35	
Informal group	1,426	0	1	0.12	
Commercial gym	1,426	0	1	0.25	
Unorganized	1,426	0	1	0.10	
Missing information	1,426	0	1	0.18	
<i>Observation period</i>					
Waves 1–2	1,426	0	1	0.67	
Waves 2–3	1,426	0	1	0.33	
Sports partnership maintained at <i>t+1</i>	1,426	0	1	0.43	

For wave 1 (September 2022), respondents were asked to reflect on the social relations (confidants, friends, study and sports partners) they had in the six months before the previous summer holiday. In wave 2 (January 2023) and wave 3 (July 2023), they were asked to reflect on their social relations from the previous semester.

Following each name generator, participants were asked to rate the closeness of the relationship between the listed alters. After that, respondents completed an adjacency matrix to indicate which pairs of names referred to the same alter (see [Figure A1](#)). In waves 2 and 3, following the four name generators, respondents filled out an adjacency matrix that indicated whether alters listed at that moment were the same as alters listed previously. Name interpreter questions were asked to obtain additional information about the alters and dyadic relationships.

Descriptive statistics

[Table A1](#) describes the characteristics of egos. [Table A2](#) describes the characteristics of their sports partners at time *t*.

Can you confirm if the individuals you studied with are the ones previously mentioned? To do so, please tick the corresponding box for each person indicating if their name matches one previously mentioned. If there are no matches, you may proceed by clicking on 'Next'.

	Study partner: Mustafa	Study partner: Rob	Study partner: Katrín	Study partner: Sara
Aforementioned person: Sara	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Aforementioned person: Peter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aforementioned person: Katrin	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Aforementioned person: John	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure A1. Screenshot of the CAPI interface used by a hypothetical 'sports and friendships' respondent to match alters after the 'study network' name generator.

Appendix B. Average marginal effects and underlying multilevel logit model results

Figure B1 shows the AMEs of all variables included in our models. Table B1 shows the underlying logit model results.

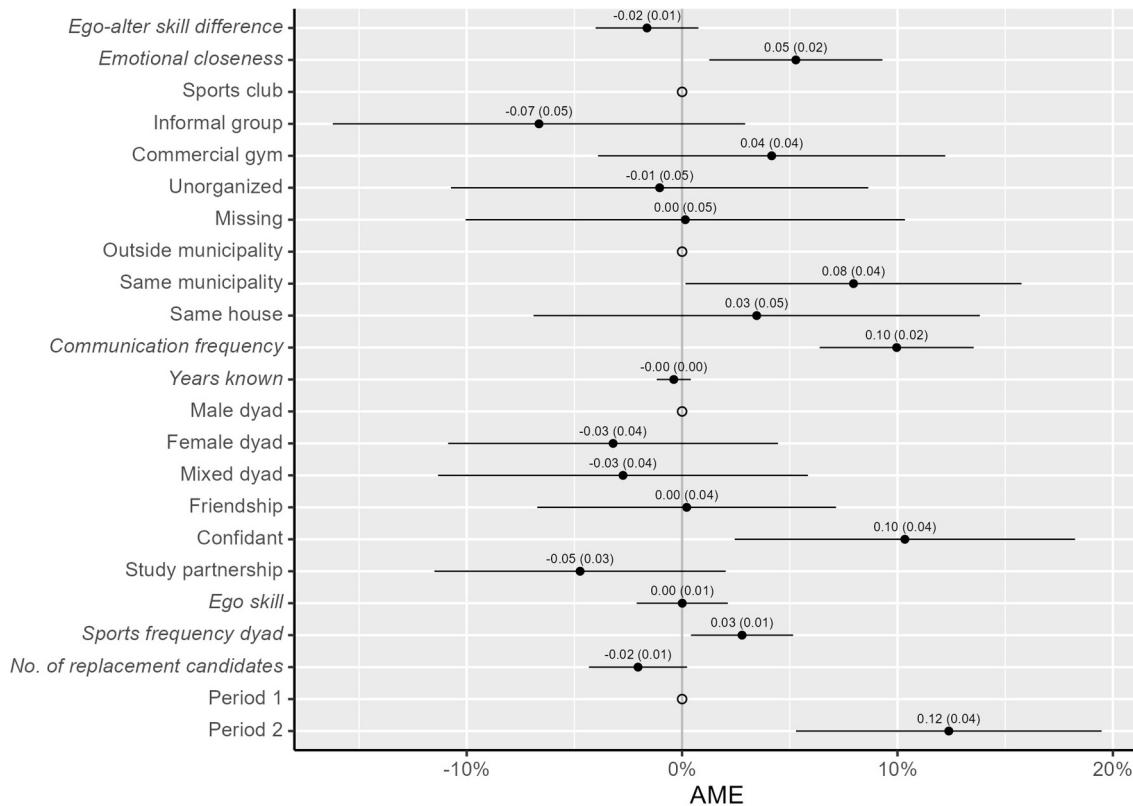


Figure B1. Average marginal effects on the maintenance of sports partnerships at $t+1$. Notes: Average marginal effects (AME) represent the average change of the probability that the outcome equals (i.e., a sports partner is maintained) for a one-unit change in the explanatory variable of interest. For dichotomous variables, we compare a change in predicted value between the reference category (denoted by the unfilled point on the zero line) and the category of interest. For continuous variables (indicated in italics), we take the partial derivative. We took both fixed and random effects into account when calculating predicted outcomes. Effects are transformed to percentages. Error bars reflect 95% bootstrapped ($N=500$) confidence intervals.

Table B1. Results of multilevel logit models predicting sports partnership continuation.

	M1: main predictors	M2: sports behavior dyad	M3: dyadic covariates	M4: multiplexity	M5: replacement candidates
(Intercept)	-0.65 (0.12)***	-0.68 (0.12)***	-0.80 (0.24)**	-0.93 (0.26)***	-0.86 (0.26)***
Ego-alter skill difference	-0.08 (0.07)	-0.09 (0.07)	-0.09 (0.07)	-0.10 (0.07)	-0.09 (0.07)
Emotional closeness	0.55 (0.07)***	0.56 (0.07)***	0.33 (0.09)***	0.23 (0.10)*	0.24 (0.10)*
Informal group	-0.22 (0.22)	-0.10 (0.22)	-0.19 (0.23)	-0.25 (0.24)	-0.33 (0.24)
Commercial gym	0.47 (0.17)**	0.47 (0.17)**	0.30 (0.18)	0.27 (0.19)	0.20 (0.19)
Unorganized	0.13 (0.22)	0.23 (0.23)	0.07 (0.24)	0.05 (0.24)	-0.05 (0.25)
Missing	0.03 (0.24)	0.06 (0.24)	-0.10 (0.25)	0.00 (0.25)	0.01 (0.25)
Period: waves 2-3	0.68 (0.18)***	0.68 (0.18)***	0.66 (0.18)***	0.61 (0.19)***	0.59 (0.19)***
Ego skill	0.09 (0.07)	0.01 (0.08)	-0.00 (0.08)	-0.00 (0.08)	0.00 (0.08)
Mean sports frequency dyad		0.21 (0.07)**	0.16 (0.07)*	0.16 (0.08)*	0.18 (0.08)*
Same municipality			0.36 (0.18)*	0.39 (0.18)*	0.39 (0.18)*
Roommate			0.19 (0.25)	0.20 (0.25)	0.17 (0.25)
Communication frequency			0.54 (0.10)***	0.50 (0.10)***	0.50 (0.10)***
Years known			-0.04 (0.07)	-0.07 (0.07)	-0.07 (0.07)
Woman-man			-0.07 (0.22)	-0.12 (0.22)	-0.13 (0.22)
Woman-woman			-0.13 (0.20)	-0.15 (0.20)	-0.15 (0.20)
Friendship				0.03 (0.18)	0.01 (0.18)
Confidant				0.49 (0.18)**	0.48 (0.18)**
Study partner				-0.21 (0.18)	-0.23 (0.18)
No. of replacement candidates					-0.14 (0.08)
AIC	1830.18	1823.41	1790.83	1786.93	1785.89
BIC	1882.80	1881.30	1880.30	1892.18	1896.40
Log Likelihood	-905.09	-900.71	-878.42	-873.47	-871.94
Num. obs.	1426	1426	1426	1426	1426
Num. groups: ego	409	409	409	409	409
Var: ego (Intercept)	0.29	0.29	0.35	0.37	0.36

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

Appendix C. Data collection and descriptive statistics of Study 2

Data collection

For Study 2, we used survey data of “Transition into Active Living” (TRIAL) project. The overarching aim of this study was to examine the influence of various life course transitions on individuals’ physical activities and sports participation. The surveys were conducted by the survey agency I&O Research (I&O Research, n.d.). I&O Research maintains a panel of individuals who have granted permission to take part in repeated online survey tasks. In 2021, the panel consisted of nearly 32K active members. Panel participants are selected through probability sampling; typically, via sampling from the (Municipal) Personal Records Database (in Dutch: BRP). In addition, I&O Research recruits participants via sampling from the Basic Registration Addresses and Buildings (in Dutch: BAG) and through targeted campaigns and social media.

In October 2021, all panel members aged 16–40 ($N = 7,646$) were invited to complete the first questionnaire. In October 2022, those who had completed the first survey (response rate: 46%) and who were still part of the survey panel ($N = 4,560$) were invited for a second survey task (response rate: 70%). Our choice experiment was implemented in this second survey wave. Survey participants were incentivized through a point system: respondents earn points depending on the number, length, and complexity of survey tasks, and after reaching a specific threshold, these points can be exchanged for vouchers or to make a charitable donation.

Table C1 shows descriptive statistics of key variables describing our sample.

Table C1. Descriptive statistics of TRIAL sample.

	Count	Mean	SD	Min.	Max.
Age	3,206				
Gender (1=yes, 0=no)					
Man	3,206				
Woman	3,206				
Other/missing	3,206				
Education (1=yes, 0=no)					
Low	3,206	0.02			
Medium	3,206	0.21			
High	3,206	0.76			
Currently active in sports (1=yes, 0=yes)	3,206	0.64		0	1
Number of sports types currently involved in ^a	2,067	1.49	0.68	1	3
Current weekly sports frequency ^a	2,067	2.64	1.77	0.50	14

^aOnly those currently active were included in this measure. Respondents could list a maximum of 3 sports activities.