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Friendship Quality, Friendship Quantity, and Social Participation in Adults with Traumatic Brain Injury

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Abstract

Background: Adults with TBI often report reduced social participation and loss of friends, but little is known about quality of friendship after TBI. Our objective was to characterize social participation, friendship quantity, and friendship quality of adults with traumatic brain injury (TBI) and a comparison group of uninjured adults.

Methods: Participants included 18 adults with moderate to severe TBI and 16 of their informant friends; 18 uninjured adults and 11 of their informant friends. The main measures used were the Participation Assessment with Recombined Tools-Objective (PARTO), the Social Network Questionnaire (SNQ), and the McGill Friendship Questionnaire (MFQ).

Results: Participants with TBI reported significantly less social participation. The adults with TBI had fewer total friends, although this difference was not statistically significant. Adults with TBI differed from their friends on one measure of friendship quality, but reports for friendship quality were high in both groups.

Conclusion: Adults with TBI overall reported high levels of friendship quality despite having lower levels of social participation compared with uninjured adults. Future research should investigate the how the balance of quantity and quality of friendships relates to satisfaction with social participation and overall quality of life.

Keywords

adult; brain injury; friends; quality of life; social participation

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Disclosure of Interest

The authors report no conflicts of interest.

Introduction

Loss of friendships is a major negative consequence of TBI for many adults¹⁻⁷. Adults with TBI report difficulty not only maintaining previous relationships but also establishing new relationships^{3,5,8}. Friendships are associated with benefits such as improved social trust, decreased stress, better health, increased morale, and perceived social support⁹⁻¹¹; so it is not surprising that loss of friendships can affect quality of life (QoL) after TBI^{1,5,12,13}.

While number of friends is important, the quality of those friendships may also contribute to QoL. The literature on friendship development in uninjured populations shows that a close friend serves critical social and psychological functions^{14,15}. Vaux and Harrison^{14,15} reported that adults were more satisfied with their support networks when the support network was comprised of strong relationships. In adults with TBI there is limited information on the quality of friendships, but some research suggests that friendship quality might be worse off^{17,18}. In addition, there are hints in related literature that quality might be important. For example, activity participation in adults with TBI was associated with better QoL and fewer self-reports of loneliness, but only when activities were interesting to the individual and involved interaction with others¹², that is, when activities were perceived as having high quality.

Strong family relationships might substitute for friendships for adults with TBI¹⁹, but friendships differ from familial relationships in important ways. DuPertuis, Aldwin, and Bosse²⁰⁻²² hypothesized that family support is more important for physical needs, whereas friendships are more important for avoiding adverse psychological outcomes such as loneliness and low morale. Friendships may have psychological benefits because they are voluntary and usually established through shared interests and a desire for interaction²⁰⁻²². In addition, friendships lack the obligatory nature of family relations. Simply having a friend can improve well-being because being a friend implies that the individual is desirable as a friend²³.

Friends and family also differ in how relationships are maintained²⁴. Relationship maintenance requires, at the most basic level, communication and interaction between two individuals²⁵. Friendship maintenance, however, requires much more communication and activity participation than maintaining relationships with family²⁴. The voluntary nature and necessary maintenance essential for friendships could help explain why adults with TBI have difficulty both sustaining old friendships and developing new ones.

Reduced social participation is another negative consequence of TBI²⁶. Social participation is important to consider when studying friendships because it could contribute to a person's ability to maintain relationships and opportunities to form new relationships; and if people do not maintain relationships with communication and in person interaction then that relationship may decline over time^{24,25}.

In summary, there is evidence that individuals with TBI have reduced social participation and fewer friendships than they had pre-injury, but there is a paucity of information regarding the quality of remaining friendships. Social participation levels have been shown to be significantly lower in individuals with TBI than uninjured adults²⁶ and the literature

frequently reports lower numbers of friends post injury; but there are few reports of specific numbers of friends post injury and no known comparisons between quantity and quality of friends for adults with TBI to a comparison group. This is concerning because it is difficult to assess the extent of impairment for adults with TBI without a comparison of social participation and friendship characteristics to uninjured populations.

Research addressing this gap in knowledge will help create a fuller picture of social life experienced by adults with TBI and guide intervention to improve social outcomes. If friendship quality is good, but social participation is low, intervention could target social participation and opportunities to interact with current friends. If friendship quality is poor, intervention could focus on a combination of direct intervention strategies and communication partner training to facilitate improved interactions in current relationships.

The aims of this study were to extend earlier research on social participation and friendship quantity in adults with TBI, and address the gap in knowledge regarding friendship quality in adults with TBI. Participants were adults with and without TBI, and friends nominated by each study participant. The study hypotheses were that: 1) adults with TBI would report less social participation than uninjured adults; 2) adults with TBI would report fewer total friends than uninjured adults; 3) friendship quality reported by adults with TBI would be lower than that reported by uninjured adults; and 4) adults with TBI would report higher friendship quality than would their informant friends, i.e., indicating an asymmetrical relationship.

Methods

Participants

Participants were 18 adults with TBI (TBI group) and 18 adults without TBI (comparison group) matched individually for age (± 2 years), sex, and education. Participants were recruited from local communities in the Midwestern United States as part of a larger study of social communication in adults with TBI. Demographic and injury details are listed in Table 1. Inclusion criteria for all participants were self-report of speaking English as a primary language, and no self-reported history of medical or neurological disease affecting the brain, or language or learning disability (pre-morbidly for those with TBI). Participants with TBI had sustained a moderate-severe injury as defined by nationally accepted criteria as outlined in Malec, Brown, Leibson, Flaada, Mandrekar, Diehl, and Perkins²⁷. A TBI is classified as moderate-severe if an individual meets one or more of the following criteria: Loss of consciousness of 30 minutes or more, posttraumatic anterograde amnesia of 24 hours or more, Glasgow Coma Scale score <13 in first 24 hours post injury, intracerebral hematoma, subdural hematoma, epidural hematoma, cerebral contusion, hemorrhagic contusion, penetrating TBI, subarachnoid hemorrhage, or brain stem injury²⁷. In addition, participants with TBI were at least six months post injury, were out of posttraumatic amnesia, and were understandable to a naïve listener. Exclusion criteria were failing a hearing screening test or scoring in the aphasic range on the Western Aphasia Battery Bedside Screening Test for aphasia²⁸.

Each participant nominated a close friend to serve as an informant. The informant friend was defined as a non-family member and someone with whom the participant communicated on

a regular basis. An informant friend could not be a medical provider or other professional contact. Participants unable to nominate an informant friend were not included in the final analysis. We recognize that this potentially creates a selection bias favoring individuals with friends; however, this was a necessary exclusion because completion of the friendship quality measures (the McGill Friendship Questionnaire-Friendship Function and McGill Friendship Questionnaire-Respondent Affection) required a participant to have a friend. Two participants with TBI were unable to nominate an informant friend; all comparison participants nominated an informant friend. Two female informant friends of TBI group participants and seven male informant friends of comparison group participants did not return the friendship quality measures. Participants whose informant friends did not return the questionnaires were still included in final analysis to maintain a balanced ratio of males to females in both groups.

Measures

Social Participation—Social participation was measured using the Participation Assessment with Recombined Tools-Objective (PART-O) ²⁹. The PART-O includes questions about the number of hours a week spent working or school, the type and frequency of social activities, and if the individual has any intimate relationships or meaningful friendships ²⁹. The PART-O has 17 items divided into three domains: productivity, social relations, and “out and about.” The PART-O averaged total score across the three domain scores was the dependent variable for data analysis. In addition, question one of the PART-O (“In a typical week, how many hours do you spend working for money, whether in a job or self-employed?”) was looked at individually to characterize participants’ employment status.

Friendship Quantity—The Social Network Questionnaire (SNQ) ²⁴ was used as a measure of friendship quantity, to compare current participants to the existing literature on friendship after TBI. The SNQ is in a table format and requires the participant to generate a list of all the people he or she considers a friend. Friends were listed using initials to maintain anonymity. For each friend listed, the participant also identified the type of relationship, gender, usual type of contact, last date of contact, emotional closeness, physical distance, and length of relationship. Friends could include anyone with whom the participant had interacted within the past 12 months and whom he or she had a personal relationship (including close friends, neighbors, colleagues, or people he or she interacted with on a regular basis at a club or activity). Friends could not include family members, spouses, professional/business contacts, or anyone the participant did not consider part of their social network. Participants were encouraged to reference any resource to identify friends, including lists of contacts (e.g., cell-phone contacts, email contacts), to prompt memory and promote completion of an exhaustive list. Participants were instructed in advance to bring their cell phones, address books, and other resources to the testing session so they would be prepared for this task. The dependent variable for analysis was total number of friends. The other components of the SNQ were not analyzed because they were outside the scope of this study.

Friendship Quality—The McGill Friendship Questionnaire (MFQ) was used as a measure of friendship quality ³⁰. Each participant and informant friend was instructed to complete the

MFQ with the other person in mind. The MFQ has two parts: Respondent Affection (MFQ-RA) and Friendship Function (MFQ-FF). The MFQ-RA asks about satisfaction and strength of the friendship. The MFQ-RA has 16 items, such as “I care about____” and “I am pleased with my friendship with ____”, that are answered on a nine-point Likert scale ranging from “-4: very much disagree” to “4: very much agree.” MFQ-RA responses were averaged to obtain a mean score. The MFQ-FF asks how frequently a friend completes various functions. The MFQ-FF has 30 items, such as “____ helps me when I need it”, “____ makes me laugh”, and “____ would stay my friend even if other people did not like me”, answered on a nine-point Likert scale ranging from “0: Never” to “8: Always.” MFQ-FF responses were averaged to obtain a mean score. The MFQ-RA and MFQ-FF provided information about friendship quality in both groups as well as the mutuality and reciprocity of friendships between participants and their informant friends. Mean scores for the MFQ-RA and MFQ-FF were entered as the dependent variables into data analysis.

Measures to Characterize the Sample

Following the recommendations of the Common Data Elements project ³¹, participants completed the following neuropsychological tests to characterize the sample: California Verbal Learning Test CVLT-II ³²; Wechsler Adult Intelligence Scales (WAIS-IV) Coding and Symbol Search subtests ³³, to calculate a Processing Speed Index (PSI); and Trail Making Test B ³⁴.

Statistical Analysis

Social participation, friendship quantity, and friendship quality scores were compared between groups using t-tests, with a criterion alpha level of .05 and Bonferroni correction for multiple comparisons. As the hypotheses were directional, we used one-tailed t-tests for all comparisons. Cohen’s d effect sizes were calculated for statistically significant findings.

Procedures

Participants provided informed consent then completed the study protocol, which took 45 to 90 minutes, depending on each participant’s response time. Participants were compensated for their time.

Informant friends were mailed a cover letter describing the study, a consent form, and questionnaire forms. Completion of informant friend tasks was estimated to take less than 15 minutes, and informant friends were mailed a \$5 gift card to thank them for their time and effort. The relevant institutional review board approved all procedures.

Results

Group Characteristics

Demographic characteristics are summarized in Table 1. Groups did not significantly differ in age, $t(34)=-0.62$, $p=0.73$ or education $t(34)=-.51$, $p=.61$. Neuropsychological test scores are summarized in Table 2. The TBI group scored significantly lower than the comparison group for all neuropsychological measures: CLVT-II Five Trials, $t(34)=4.62$, $p<0.001$;

CLVT-II Short Delay, $t(34)=4.69$, $p<0.001$; CLVT-II Long Delay, $t(34)=4.88$, $p<0.001$; Trails B, $t(34)=1.89$, $p=0.03$; WAIS PSI, $t(34)=3.01$, $p<0.001$.

Social Participation

Data for social participation measures are summarized in Table 3. The first hypothesis was supported, as participants with TBI reported significantly lower PART-O averaged total scores than the comparison group $t(34)=4.31$, $p<0.001$.

Question one on the PART-O provided information on employment. In the comparison group 77.78% of participants worked 35 or more hours per week, 5.56% worked 20-34 hours, 5.56% worked 10-19 hours, 5.56% worked 1-9 hours, and 5.56% worked 0 hours. In the TBI group 16.67% of participants worked 35 or more hours per week, 11.11% worked 20-34 hours, 22.22% worked 10-19 hours, 16.67% worked 1-9 hours, and 33.33% worked 0 hours.

Friendship Quantity

Data for friendship quantity measures are summarized in Table 3. The second hypothesis was not supported. Participants with TBI reported fewer friends than the comparison group on the SNQ but this difference was not significant, $t(34)=1.53$, $p=0.07$.

Friendship Quality

Between-group comparisons of friendship quality data are summarized in Table 3. The third hypothesis was not supported because there were no significant differences between the TBI and comparison group for the MFQ-FF, $t(34)=0.96$, $p=0.17$ or the MFQ-RA, $t(34)=1.22$, $p=0.12$.

Within-group comparisons of friendship quality are summarized in Table 4. The fourth hypothesis was partially supported. There was no significant difference between TBI Group members and their informant friends on the MFQ-FF, $t(15)= -0.75$, $p=0.77$. There was a significant group difference for MFQ-RA with informant friends reporting lower scores than the TBI group, $t(15)= 1.89$, $p=0.04$. The effect size for this finding was 0.58 (a medium effect). There were no within-group differences in the comparison group for the MFQ-FF, $t(10)=0.08$, $p=0.47$ or the MFQ=RA, $t(10)= -0.26$, $p=0.60$.

Discussion

We hypothesized that adults with TBI would report less social participation, fewer friends, and poorer quality of friendships than would uninjured adults; and also that within dyads of people with TBI and their uninjured friends, uninjured friends would describe that friendship as less rewarding than would the person with TBI. Our hypotheses were partially supported, with some unexpected findings. We next consider these findings in the context of previous literature on friendships after TBI, and discuss possible implications for intervention and future research.

Social Participation and Quantity of Friendship

As hypothesized, adults with TBI reported significantly less social participation than peers without TBI. This finding is consistent with a previous study by Bogner and colleagues³⁵, who reported PART-O averaged total scores of 1.92 (vs. 1.88 for the TBI group in this study) for adults undergoing rehabilitation after a TBI, spinal cord injury, or stroke; and 2.46 for adults without a disability (vs. 2.85 for the comparison group). These similarities in PART-O scores show that for individuals with acquired injuries, including TBI, reduced social participation is a concern in both the acute and chronic stages of recovery.

The finding of lower PART-O averaged total score for the TBI group is consistent with reports that adults with TBI have reduced social participation^{1,3-5,7,8,26}. A lower PART-O for the TBI group indicated fewer interactions with friends and family, less time working or in school, and less frequent activity in the community. Overall, these findings support evidence that social participation is restricted after TBI, which is a major concern because it may contribute to the social isolation and reduced quality of life reported by many adults with TBI^{1,5,7,26,36}. Consistent findings across stages of recovery, countries around the world, and cultural groups; and links between social participation and health and wellbeing⁹⁻¹¹, reinforce the critical need to improve social participation for adults with TBI.

Our study included a comparison group of adults without TBI, matched for age, education, and sex, which allowed us to compare quantity of friends between adults with TBI and their uninjured peers. To our knowledge, no previous studies have provided a friendship quantity comparison between these groups. Adults with TBI identified almost a third fewer friends than their uninjured peers, consistent with previous research showing reduced number of friends after TBI^{3,4,6,7}. The difference was not statistically significant, but there was a trend in the expected direction, and significant differences may have been observed in either a larger sample or a sample that did not exclude individuals who were unable to nominate a friend.

The number of friends reported by participants with TBI in our study ($M = 15.67$) was substantially larger than previously reported by Hoofien and colleagues³, who found that adults with severe TBI reported an average of 2.7 close friends. This discrepancy is possibly because Hoofien and colleagues asked participants to estimate the number of their close friends via free recall, a problematic method in a group with memory impairments. Our study participants had access to paper and electronic resources when completing the form, which helped ensure that friend lists were as complete and comprehensive as possible.

Social participation and number of friends may interact. Reduced numbers of friends could limit opportunities for social participation and limited social participation could contribute to fewer numbers of friends. For example, adults with TBI are known to have lower levels of employment^{7,36-38}. In this study 16.67% of adults with TBI were employed full time compared to 77.78% of adults in the comparison group. Work colleagues make up a notable portion of adult social networks³⁹, thus if individuals are not working this limits opportunities to expand their social network. Further, if adults with TBI are unemployed, they may not be able to afford social activities. Adults with TBI also may have low socioeconomic status, in part because of lost employment, and the stress associated with low

SES also can negatively affect social networks and result in reduced resources to participate in social activities^{40,41}. Many adults with TBI do not drive or do not have a reliable source of transportation^{8,42}, which also is a barrier to planning and attending social activities. In a study by Rapport, Bryer, and Hanks⁴², adults with TBI who did not drive reported reduced social integration, social mobility, and employment as compared to those who did drive. Transportation and SES were not addressed in this study, but should be incorporated into future research to characterize how they and employment could contribute to social participation and quantity of friendships after TBI.

Friendship Quality

A surprising finding was the high friendship quality within dyads of friend pairs, even if one of the dyad members had a TBI. There was no group difference in reporting of friendship function (MFQ-FF). Informant friends did report significantly lower affection (MFQ-RA) for their friend partner with TBI, but both partners rated affection highly overall (on a scale of -4 to 4, means scores were 3.64 for the TBI group and 3.34 for informant friends). Given the high overall ratings of friendship-related affection, it is not clear that the significant difference is clinically meaningful. Overall, the two measures of friendship quality suggest that adults with TBI in our study had at least one high-quality friendship and both individuals in the friendship viewed the relationship in a positive light.

One reason for the high friendship quality ratings in both groups might be that most informant friends were long term, well-established relationships. On average, participants knew their informant friends for more than 10 years, and in the TBI group over half of participants knew their informant friend prior to the injury. Anecdotally, participants with TBI often expressed that their nominated friend was “the one person who has stuck with them.” Thus, length and closeness of friendship could have contributed to the overall high friendship quality ratings. This explanation is consistent with evidence that close, well-established relationships are less likely to decay over time⁴³, and suggests that supporting long-term friendships could be an important goal of rehabilitation.

Outside of friendship quality ratings, there are other between group differences worth noting. Two participants in the TBI group were unable to nominate an informant friend. These participants completed the SNQ, but did not feel comfortable nominating anyone they listed. By contrast, all comparison group members could identify an informant friend. This finding suggests that while most adults with TBI have one quality friendship, that is not true for everyone with TBI.

Friendship quantity and friendship quality likely play different roles in social outcomes and quality of life after TBI. For adolescents, having one “best friend” provides the social benefits of friendship^{44,45}, and that might be true for adults with TBI as well. Future studies should investigate satisfaction with the quantity and quality of current friendships and the amount of social interaction. Findings will characterize the relationship of friendships and social participation to an individual’s quality of life, which may help to guide intervention.

Implications for Intervention

Regarding intervention, our findings support the need to consider how gains in clinic will translate into social participation and maintaining relationships. For example, an adult with TBI may have a therapy goal related to organization and planning. A therapy activity targeting this goal could involve planning a social activity in the community. The outcome measure could be the client's ability to identify an activity of interest, reach out and contact a friend to join in the activity, and follow through with the activity. This intervention approach could be applied to a variety of rehabilitation goals while simultaneously providing an opportunity to promote social participation and maintain relationships with friends.

In addition, replication of earlier findings of low social participation provides further support that adults with TBI in the long-term phases of recovery need community supports to facilitate participation in social activities. These supports could include pre-structured social activities planned by a support group or other community resource, as pre-planned events would reduce the executive function demands that may be a barrier to social participation for many adults with TBI. Further, events such as these could provide opportunities to increase frequency of interaction with others in the community and to develop friendships.

Future Directions

Future research should investigate the balance between friendship quality, friendship quantity, and social participation. This could include studying how an individual's situation has changed over time since injury, including how number of friends has changed, that individual's satisfaction with current levels of social participation, whether individuals feel they have enough friends, and if they feel socially supported by their current friend(s). Answering these questions will illuminate the role of both friendship quality and friendship quantity in an individual's social outcomes and quality of life.

Further, future research should aim to identify predictors of friendship quality and quantity, which might include severity of cognitive impairment in areas such as executive functions, which can affect planning of social activities⁴⁶; or social cognition, which may affect interpersonal interactions⁴⁷. This would improve understanding of why some adults with TBI have better outcomes than others, with the potential to identify risk factors for poor outcomes and supports for better outcomes. Identifying positive supports for social outcomes would benefit intervention by helping clinicians target the strategies, supports, and goals most likely to yield positive outcomes.

Limitations

This study had several limitations. The sample size was small and limited by non-responses from informant friends in the comparison group (where only 11 of 18 participant and informant friend pairs were complete), although convergence of our findings with those of previous research suggests that similar findings might be obtained in a larger group. As mentioned in the methods, only including adults with TBI who could nominate a friend may have created a selection bias effect, but we felt this was a necessary exclusion to allow for study of the friendship dyads. This study also was limited by lack of information regarding overall QoL and changes in social participation and friendship after TBI. Information

regarding overall QoL would provide a context for social and friendship outcomes observed in this study, and would improve understanding of relations among friendship quality, friendship quantity, and social participation. It would also be beneficial to compare current versus pre-TBI social participation and friendship(s). This would identify the extent of change in social network size and social participation and how that change relates to QoL.

Conclusion

Adults with TBI face many cognitive and social barriers to maintaining a high QoL after injury. This study focused on differences between adults with and without TBI in the areas of social participation, friendship quantity, and friendship quality. Overall, despite having significantly less social participation and fewer total friends than uninjured peers, most adults with TBI had at least one high-quality friendship. Our findings support previous evidence of reduced social participation in adults with TBI and provide new information about friendship quality. Our findings also suggest that adults with TBI may have larger number of friends than previously reported; though still less than uninjured adults. Future research is needed to identify the balance of friendship quantity versus quality that is needed to maintain a high QoL. This information in turn would allow interventions to target the most important aspects of friendship and social participation. For survivors in the chronic stage after TBI, QoL is of the utmost concern. Friends are an essential contributor to QoL and merit our attention in rehabilitation.

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Learner Objectives:**After reading this article the learner will be able to:**

1. Describe characteristics of friendship *quantity* in adults with TBI as compared to uninjured adults.
2. Describe characteristics of friendship *quality* in adults with TBI as compared to uninjured adults.
3. Describe social participation and barriers to social participation in adults with TBI.

CEU Questions:

1. Select the response that correctly describes our findings regarding social participation:
 - a. Adults with TBI had significantly higher levels of social participation than uninjured adults.
 - b. Adults with TBI had significantly higher levels of employment than uninjured adults.
 - c. Adults with TBI had significantly lower levels of social participation than uninjured adults.
 - d. Levels of social participation did not differ between adults with TBI and uninjured adults.
 - e. A majority of adults with TBI were employed full time.
2. Barriers to social participation in adults with TBI may include:
 - a. Transportation
 - b. Socioeconomic status
 - c. Employment
 - d. All of the above
 - e. None of the above
3. Select the response that correctly describes our findings regarding friendship *quantity*:
 - a. Adults with TBI reported an average of 15.67 friends.
 - b. There was no statistically significant difference between groups for total number of friends.
 - c. Two adults with TBI were unable to nominate an informant friend.
 - d. All of the above
 - e. None of the above

4. Select the response that correctly describes our findings regarding friendship *quality*:
 - a. Adults with TBI differed from their informant friends on the MFQ-RA; but overall ratings of friendship quality were high in all participants.
 - b. Adults with TBI did not differ from their informant friends on measures of friendship quality.
 - c. Adults with TBI had significantly lower friendship quality than uninjured adults on both the MFQ-RA and MFQ-FF.
 - d. Adults with TBI had significantly higher friendship quality than uninjured adults on both the MFQ-RA and MFQ-FF.
 - e. Adults with TBI differed from their informant friends on the MFQ-FF.

5. The number of friends reported by adults with TBI in this study is higher compared to prior research. A possible explanation for this is:
 - a. Participants could include family members in their friend lists.
 - b. Participants could use cell phones and address books to support their memory when completing friend lists.
 - c. Participants were instructed to list only best friends.
 - d. Participants could include friends from the past, even if they hadn't spoken to that friend in a year or more.
 - e. All of the above.

Table 1.

Participant demographic characteristics.

	TBI Group (n=18)	Comparison Group (n=18)
<i>Participants</i>		
Age in Years	40.38	37.94
Education in Years	14.75	15.08
Race	White = 18	White = 15 African American = 2 Hispanic/Latino = 1
Time Post Injury in Years	13.1	N/A
Cause of Injury	MVA = 13 Fall = 1 Assault = 1 Other = 3	N/A
<i>Informant Friends</i>		
Known prior to TBI	10	N/A
Age in Years	39.8	38.3
Length of Relationship in Years	14.00	10.24

Notes: TBI = Traumatic Brain Injury Group. CG= Comparison Group.

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Table 2.

Neuropsychological Test Scores.

	TBI (n=18)	CG (n=18)	<i>t</i>	<i>p</i>	d
CLVT-II Five Trials	40.56 (8.54)	54.11 (9.05)	4.62	<0.001	1.18
CLVT-II Short Delay	-1.06 (1.01)	0.36 (0.78)	4.69	<0.001	1.33
CLVT-II Long Delay	-1.47 (1.37)	0.39 (0.87)	4.88	<0.001	1.26
Trails B	-0.84 (2.00)	0.37 (1.85)	1.89	0.03	0.61
WAIS PSI	87.22 (12.63)	102.67 (17.70)	3.01	<0.001	0.94

Notes: Data are means with standard deviations in parentheses. TBI = Traumatic Brain Injury Group. CG= Comparison Group. CLVT-II = California Verbal Learning Test Second Edition, WAIS PSI = Wechsler Adult Intelligence Scale Processing Speed Index

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Table 3.

Social Participation, Friendship Quantity, and Friendship Quality.

Measure	TBI (n=18)	CG (n=18)	<i>t</i>	<i>p</i>	<i>d</i>
PART-O Averaged Total Score	2.08 (.63)	2.85 (.42)	4.31	<.001	1.08
SNQ Total Friends	15.67 (11.59)	22.50 (14.96)	1.53	0.07	
MFQ-FF	6.60 (1.10)	6.91 (.78)	0.96	0.17	
MFQ-RA	3.64 (.40)	3.48 (.39)	1.22	0.12	

Notes: Data are means with standard deviations in parentheses. TBI= Traumatic Brain Injury Group. CG= Comparison Group. PART-O= Participation Assessment with Recombined Tools-Objective. SNQ= Social Network Questionnaire. MFQ-FF= McGill Friendship Questionnaire Friendship Functions. MFQ-RA= McGill Friendship Questionnaire Respondent Affection.

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Table 4.

Self- vs. informant friendship quality ratings.

Group	MFQ-FF				MFQ-RA			
	Self (n=18)	IF (n=16)	<i>t</i>	<i>p</i>	Self (n=18)	IF (n=11)	<i>t</i>	<i>p</i>
TBI	6.73 (.93)	6.93 (.91)	-0.75	0.77	3.64 (.42)	3.34 (.59)	1.89	0.04
CG	7.01 (.72)	6.98 (.75)	0.08	0.47	3.49 (.38)	3.53 (.46)	-.26	0.60

Notes: Data are means with standard deviations in parentheses. MFQ-FF= McGill Friendship Questionnaire Friendship Functions. MFQ-RA= McGill Friendship Questionnaire Respondent Affection. TBI= Traumatic Brain Injury Group. CG= Comparison Group. IF= Informant Friend.