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THE RESULTS OF THE PILOT STUDY OF THE SIBLING RELATIONSHIP

The relevance of the research problem is due to the low level of study in Kazakh psychology. The purpose of this study is to confirm the effectiveness of the selected mixed methods for studying sibling relationships, since in previous studies of sibling relationships, blank methods were mainly used. The scientific and practical significance of this study lies in conducting an experiment using a cybernometer device supplemented with valid techniques. The work tested the hypothesis that the relationship of adult siblings can be influenced by the age difference between them, gender, lack of joint activity. The study involved 18 subjects (9 pairs) aged from 14 to 50 years. At the 1st stage of the study, all subjects participated in an experiment on a cybernometer with their siblings, and at the 2nd stage, all siblings answered a specially prepared battery of questionnaires. Such features as empathy in sibling relationships and trust in each other, revealed during the experiment, were also revealed as a result of the survey. The value of the research lies in expanding the scope of the cybernometer device in psychological research. The data obtained from sibling subjects who performed tasks according to specific instructions on a cybernometer are confirmed by the results of standardized techniques. It has been proven that the relationship between siblings is influenced by the age difference between them and the gender of the siblings. The conducted pilot study confirmed the correctness of the chosen methods for studying sibling relationships, and they can be used in the main study.

Key words: sibling, sibling relationship, cybernometer, joint activity, compatibility.

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Сиблингтердің өзара қатынастарын пилотажды зерттеу нәтижелері

Зерттеу мәселесінің өзектілігі қазақстандық психологияда аз зерттелінгендігімен шарттанған. Бұл зерттеудің мақсаты сиблингтердің өзара қатынастарын зерттеу үшін таңдалған аралас әдістердің тиімділігін дәлелдеу болып табылады, себебі осыған дейінгі сиблингтік қатынастарды зерттеулерде негізінен бланкілік әдістемелер қолданылған. Зерттеудің ғылыми және практикалық тұрғыдан маңыздылығы, кибернометр аппаратының көмегімен эксперимент жүргізілгендігінде, және ол валидті әдістемелермен толықтырылды. Жұмыста ересек сиблингтердің қарым-қатынастарына олардың арасындағы жастық айырмашылықтар, жыныстары, бірлескен іс-әрекеттің болмауы әсер етуі мүмкін, деген болжам тексерілді. Зерттеуге 14 пен 50 жас аралығындағы 18 зерттелуші (9 жұп) қатысты. Зерттеудің бірінші кезеңінде барлық зерттелушілер өз сиблингтерімен бірге кибернометрді қолдана отырып жүргізілген экспериментке қатысты, ал екінші кезеңде барлық сиблингтер арнайы дайындалған сұрақтамалар батареясына жауап берді. Эксперимент барысында анықталған сиблингтік қарым-қатынастардағы эмпатия, бір-біріне деген сенімділік сияқты ерекшеліктер сұрақтамалар нәтижесінде де анықталды. Зерттеудің құндылығы психологиялық зерттеулерде кибернометр аппаратының қолданылу аясын кеңейту болып табылады. Кибернометрде белгілі-бір нұсқаулар бойынша тапсырмаларды орындаған зерттелінуші сиблингтерден алынған деректер стандартталған зерттеу әдістемелерінің нәтижелерімен расталды. Сиблингтердің қарым-қатынастарына олардың арасындағы жастық айырмашылықтары мен сиблингтердің жынысы әсер ететіні дәлелденді. Жүргізілген пилотажды

лингтердің өзара қатынастарын зерттеу үшін таңдап алынған әдістердің дұрыстығын дәлелдеді, және оларды негізгі зерттеуде қолдануға болады.

Түйін сөздер: сиблинг, сиблингтік өзара қатынас, кибернометр, бірлескен іс-әрекет, үйле-сімділік.

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Результаты пилотажного исследования взаимоотношений сиблингов

Актуальность проблемы исследования обусловлена малой изученностью в казахстанской психологии. Целью данного исследования является подтверждение эффективности выбранных смешанных методов для изучения взаимоотношений сиблингов, поскольку в предшествующих исследованиях сиблинговых отношений в основном применялись бланковые методики. Научная и практическая значимость данного исследования заключается в проведении эксперимента с помощью аппарата кибернометр, дополненного валидными методиками. В работе проверялась гипотеза о том, что на отношения взрослых сиблингов может влиять разница в возрасте между ними, пол, отсутствие совместной деятельности. В исследовании приняли участие 18 испытуемых (9 пар) в возрасте от 14 до 50 лет. На 1-м этапе исследования все испытуемые участвовали в эксперименте на кибернометре со своими сиблингами, а на 2-м этапе все сиблинги отвечали на специально подготовленную батарею опросников. Такие особенности, как эмпатия в отношениях сиблингов, доверие друг к другу, выявленные в ходе эксперимента, были выявлены и в результате опроса. Ценность исследования заключается в расширении сферы применения аппарата кибернометр в психологических исследованиях. Данные, полученные от испытуемых сиблингов, которые выполняли задания по определенной инструкции на кибернометре, подтверждены результатами стандартизированных методик. Было доказано, что на отношения между сиблингами влияет разница в возрасте между ними и пол сиблингов. Проведенное пилотажное исследование подтвердило правильность выбранных методов для изучения сиблинговых взаимоотношений, и они могут быть использованы в основном исследовании.

Ключевые слова: сиблинги, сиблинговые взаимоотношения, кибернометр, совместная деятельность, совместимость.

Introduction

Currently, there are many changes in the family institution. Some of them have led to changes in the relationships between siblings raised in the same family. In family dynamics, relationships between siblings play an important role. Unfortunately, there are few studies in Kazakhstani psychology on cooperation between brothers and sisters, unity, unconditional love for each other, passed down from generation to generation. This fact determines the relevance of the research topic.

The purpose of this experimental pilot study was to verify the correctness of the application of the selected mixed methods in studying sibling relationships. The object of the study is adult siblings. The subject of the study is the peculiarities of adult sibling relationships. It was hypothesized that the relationship of adult siblings can be influenced by the age difference between them, gender, and lack of joint activities. Therefore, it was decided not to limit the research to the use of tests, but to study

their relationships during joint activities on a cybernometer within the framework of the experiment.

“Siblings” are people who have the same parents, or who have at least one parent in common. If they have two parents in common, they are called full siblings. And if only one parent is a biological parent, they are called half-siblings (Psychological Dictionary).

The concept of “siblings” was introduced into psychology by F. Galton and A. Adler in the 19th century, although the word “sibb” itself could be found in Old English, denoting a kinship in the broad sense. Later, the problems of sibling relationships were studied in psychoanalysis (Kassen et al., 2023), in individual psychology (Adler, 2015) and in analytical psychology (Shevtsova, 2022).

Relationships between siblings are formed through the exchange of information between them (Whiteman et al., 2011). Sibling relationships are bidirectional and long-term (Tomeny et al., 2016). Sibling relationships are influenced by the individual characteristics of these siblings (McHale et

al., 2012), as well as the type of family. If there are children with disabilities in the family, this can significantly affect the relationship between siblings (Hayden et al., 2023).

Siblings living together interact with each other quite often to some extent. But there are also adult siblings living separately – can they maintain emotionally close relationships?

According to N.N. Obozov, in interpersonal relationships, people are ready for a certain type of interaction. During this interaction, joint activities of individuals can cause both positive and negative, as well as neutral emotions. And the very first interpersonal relationships in a person's life occur in the family (Obozov, 2002: 28-33).

In this regard, it should be noted that very few studies have been published that comprehensively study and examine sibling relationships. Russian psychologist O.V. Almazova, noting that there are very few studies on adult siblings, gave a description of sibling relationships in each age period. In addition, the author proposed an explanation for sibling relationships by the specifics of their attachment to their mother (Almazova, 2013: 54-60).

A.D. Davletova's PhD thesis "Personality orientation in the psychological space of the parental

family (based on the study of a Kazakh family) was the first scientific work in Kazakhstan to study children in a Kazakh family depending on their birth order and position. The work identified the personality traits of younger, middle and older children, as well as the overall nature of the relationship between parents and children (Davletova, 2003).

Relationships between people include such major aspects as communication and joint activities, which, in turn, largely depend on factors such as mutual understanding, compatibility, coherence, coordination of individual actions, etc. In other words, both the emotional side (compatibility) and the functional side (coherence) are valuable. In the situation of sibling relationships, the importance of all the above parameters is difficult to overestimate, since family members have led or continue to lead a joint life, which is characterized by the presence of a closer and deeper connection between them.

Literature review

As part of the theoretical analysis of the literature on sibling relationships, a content analysis was conducted. Its results are clearly presented in Table 1 (Musa et al., 2024).

Table 1 – Foreign, Russian and Kazakh studies of sibling relationships

#	Time period, country	Authors	Contribution to science
International			
1	Austria	Alfred Adler	In the 19th century, he was one of the first to introduce the concept of «siblings» into psychology. He clarified that the order of birth and the place that a child occupies in the family hierarchy, the role that he or she plays, have a fundamental impact on their future adult life. His assumption about the importance of sibling dynamics in psychological adaptation has been confirmed.
2	Switzerland	C.G. Jung	He spoke about the importance of not the order of birth of a child, but the family atmosphere created by parents.
3	1874 USA	F. Galton	In the 19th century, he was among the first, along with A. Adler, to introduce the concept of «siblings» into psychology. He noticed that the first children (sons) more often become outstanding scientists in various fields. He suggested that firstborns are given more attention, which allows them to develop intellectually better.
4	1956 USA	A. Anastasi	Thematic literature on the relationship between family size and children's intelligence was studied, which made it possible to establish that the issue is theoretically and methodologically more complex than previously thought. The design of an ideal experiment on the topic is presented.
5	1956 USA	H. Koch	It has been determined that emotional attitudes and mental abilities of children can be related to gender, birth order and age difference between siblings.
6	1958 USA	O.G. Brim	Based on H. Koch's data, observations have been made: opposite-sex siblings have more pronounced traits of the opposite sex than same-sex siblings, and this tendency affects younger children to a greater extent.

#	Time period, country	Authors	Contribution to science
7	1963 USA	S. Schachter	It has been established that the prevalence of first-borns or only children among outstanding scientists is a reflection of the prevalence of such among students. Some explanations are given as to why the prevalence of first-borns among students of educational institutions is possible.
8	1964 USA	D.P. Irish	Researchers' attention is mainly focused on the relationship between parents and children, while sibling relationships remain unnoticed by researchers. The state of siblings in the family, throughout life, affects the development of a person's personality and their ability to adapt to various changes.
9	1973 USA	H. Weiker	Investigated the relationship between birth order and behavior during illness, comparing young and elderly people.
10	1975 USA	R.B. Zajonc, G.B. Marcus	A «fusion model» is considered, explaining the influence of birth order and family size on intelligence. It is established that the intellectual development of children in a family depends on the cumulative intellectual environment consisting of the intelligence of parents and siblings.
11	1981 USA	S. Coopersmith	It is proven that the child's birth order affects his or her self-concept.
12	2001 Georgia	Z. Stoneman	A review of the literature was made, which examined interpersonal relationships between siblings in cases where one of the children had a disability. The social roles assumed by siblings, the development of sibling relationships in the family context, and how the distribution of parental attention affects sibling relationships are analyzed.
13	2003 USA	G.H. Brody, S. Kim, V.M. Murry, A.C. Brown	The study should also take into account the personality traits of children entering sibling relationships. Parents also influence sibling relationships. Parents tell and explain how to communicate with each other correctly and, if necessary, adjust these relationships, and the relationships of adults in the family and the attitude of each of them towards the child also have a great influence.
14	2004 USA	R. Sanders	In most cases, children grow up with their siblings, and they spend a lot of time together.
15	2006 France	M. Rufo	He said that the relationship between children and parents is shorter than the relationship between siblings.
16	2007 USA	J.J. Sutor, K. Pillemer	It was shown that the development of relationships between siblings is influenced by the characteristics of upbringing of their parents.
17	2010 USA	K.J. Conger, L.F. Kramer	Systematically studied the relationship between parents and siblings.
18	2011 USA	D.R. Samek, M.A. Rueter	It was studied how emotional closeness is encouraged and promoted within the family, as well as the influence of the adoption factor. It was found that siblings are closest to each other in families where attention was paid to communication and their similarity. Emotional and behavioral closeness is also affected by: the status of «adopted/biological», age and gender of siblings.
19	2011 USA	A. Milevsky	It was found that sibling relationships and dynamic roles within them affect the development of children: their cognitive abilities, regulation of emotions, self-sufficiency, relationships with peers. At the same time, the formation of sibling relationships largely depends on parental influence, as well as a number of factors: age, gender, birth order, family size. The importance of «de-identification» / «conscious differentiation» is described, in which parents encourage children to choose different life paths, thereby reducing the possibility of comparison and competition between siblings.
20	2012 USA	S.M. McHale, K.A. Updegraff, S.D. Whiteman	Based on the analysis of studies over the past 20 years, it was found that marital and parent-child relationships have been studied more than relationships between siblings. The authors argue that sibling relationships are key in the family system and play a major role in the development and adaptation of children and adolescents.

Continuation of the table

#	Time period, country	Authors	Contribution to science
21	2020 Australia	T. Araten-Bergman, C. Bigby	Based on the analysis of research papers in Chinese and English, they formulated how representatives of Chinese society treat siblings with mental retardation.
22	2021 Austria	M. Zemp, A.S. Friedrich, J. Schirl, S. Dantchev, M. Voracek, U.S. Tran	Based on a meta-analysis of a number of studies, the authors found that there is a small positive correlation between the quality of relationships between parents and sibling relationships. The results were also influenced by the gender of the siblings within the dyads, as well as, in an unobvious way, the source of the publication.
23	2022 USA	A.C. Jensen, S.E. Killoren, N. Campione-Barr, J. Padilla, Bin-Bin Chen	A meta-analytic study of sibling relationships was conducted in various contexts: in families of white Americans and Europeans, in families of ethnic minorities, in Chinese families, and in families where one of the children had a disability. In all of these contexts, sibling relationships were influenced by individual (gender, etc.) and dyadic (same-sex/different-sex, birth order, etc.) characteristics. In some cases, emotional closeness with siblings had a positive effect on personal and social development, while conflictual relationships with siblings were associated with poorer well-being.
24	2023 Canada	C.C. Piotrowski	After studying siblings at school age, he concluded that the dynamics of sibling relationships and the roles within these relationships play a crucial role in the child's prosocial development.
25	2023 India	A.B. Panchakshari, G.K. Siddaraju	They studied the characteristics of sibling relationships in cases where one of them has a communication disorder. They showed that siblings play an important role in the development of language and literacy. In addition, they examined the characteristics of sibling relationships associated with specific disorders, such as autism, mental retardation, and stuttering.
Russia			
26	1996 Russia	T.A. Dumitrashku	It has been proven that the order of a child's birth affects his or her intellectual development, achievements, and self-esteem.
27	1998 Russia	T.K. Karatsuba	It has been emphasized that the place of a sibling affects his or her social, scientific, and political achievements.
28	2000 Russia	I.V. Ravich-Scherbo	It has been proven that the order of a child's birth affects his or her mental development.
29	2000 Russia	M. Kuzmina	A feature of sibling relationships is that they begin in a closed system in which the child does not have the opportunity to choose the gender of his sibling and how much attention his parents will pay them. Sibling relationships are based on the presence of common parents, place of residence, and environment.
30	2010 Russia	N.V. Lukyanchenko	Analyzed materials in world psychology characterizing the features of sibling positions, obtained from the point of view of the influence of the sibling position on the system of interpersonal relationships in the family and the interaction of siblings with the people around them.
31	2011 Russia	N.A. Dovgay	Tried to find out how factors of family status affect the emotional development of a child.
32	2012 Russia	E.L. Grigorenko	Studied the influence of a child's birth order on his communicative literacy.
33	2013 Russia	T.V. Yakimova	Tried to find out how the social situation of development influences the development of the child.
34	2013 Россия	N.P. Kovaleva	Studied the connection between the sibling position and sexual identity.

Continuation of the table

#	Time period, country	Authors	Contribution to science
35	2015 Russia	O.V. Almazova	She believes that Russian psychologists have very little materials on the problem of relationships between adult siblings. It turns out that research often concerns more the problem of raising siblings and the individual characteristics of siblings by their birth order.
36	2016 Russia	T.A. Gurko	Found out how marital status influences the emotional development of the child.
37	2019 Russia	N.M. Lapteva, E.A. Valueva, E.A. Shepeleva	Studied the connection between sibling relationships and sexual identity.
38	2021 Russia	O.V. Baskaeva	She said that in the past, the direction of research was focused on the birth order, gender and age differences of siblings, and now researchers are beginning to be interested in the personality traits of siblings
Kazakhstan			
39	2003 Kazakhstan	A.D. Davletova	Differences in the perception of family members and in the self-esteem of siblings depending on the birth order of children in Kazakh families were revealed.
40	2014 Kazakhstan	B.A. Amirova	The features of the communication process in an extended Kazakh family as the main institution of ethnosocialization of the individual were revealed.
41	2022 Kazakhstan	S.K. Unaibekova, M.P. Kabakova	Sibling relationships were compared in full-blooded (in the family, children have the same parents) and in half-blooded (when one of the parents is not biological) families.
42	2023 Kazakhstan	G.A. Kassen, Z.B. Madalieva	It was proven that the birth order of a child affects the development of an individual, having analyzed the research

As can be seen from the table, the topic of sibling relationships has been a part of European science since the 19th century, and then was widely covered in the studies of American scientists. In Soviet and Russian psychology, the issue was considered later, already in the 20th century, initially touching upon the social characteristics of the family and then moving on to individual psychological parameters. In Kazakhstan, the topic became a subject of scientific research only in the 21st century, where the influence of the family system of relationships on the development of children in general, as well as the order of their birth on individual psychological characteristics, was analyzed.

Materials and methods

Based on the stated objective of the study and to test the hypothesis put forward, a pilot experimental study was conducted, which involved 18 subjects,

who constituted 9 pairs of siblings. The subjects' ages ranged from 14 to 50 years; the age difference varied between 0 to 11 years. Among the subjects, there was 1 pair of twins, there were pairs with an age difference of 2 years; 4 years; 5 years; 11 years. Another 2 pairs of siblings with an age difference of 3 years, 2 pairs of siblings with an age difference of 7 years.

The sample by gender was as follows: 77.8% were female, 22.2% were male. They form sibling pairs: 22% of pairs are opposite-sex siblings, the other 78% of pairs are same-sex siblings (of which 67% are female pairs; 11% are male pairs). The data provided are clearly shown in Figure 1.

Families with two or more children were selected for the study. 77% of the subjects come from large families (from 4 to 7 children in the parental family), the remaining 23% of families have two children. 55.6% of siblings live together, 44.4% live within an hour's drive of each other.

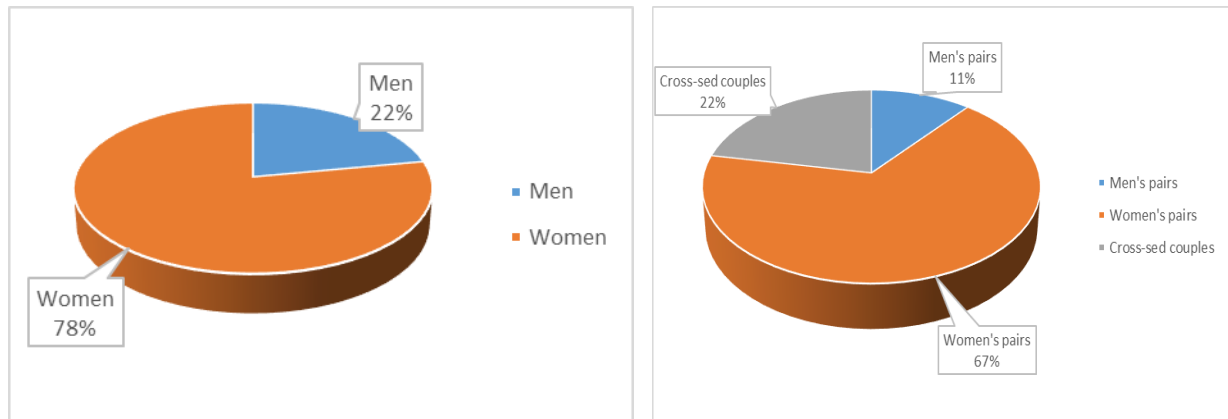


Figure 1 – Sample parameters by gender

Figure 2 shows the birth order of the siblings – participants of the experiment. 28% of the subjects are the first children in the family, 28% are the second children, 22% are the third children, 11% are

the fourth children, 6% are the sixth children, 5% are the seventh children in the parental family. All pairs of siblings are full relatives (full-blooded, children of the same parents).

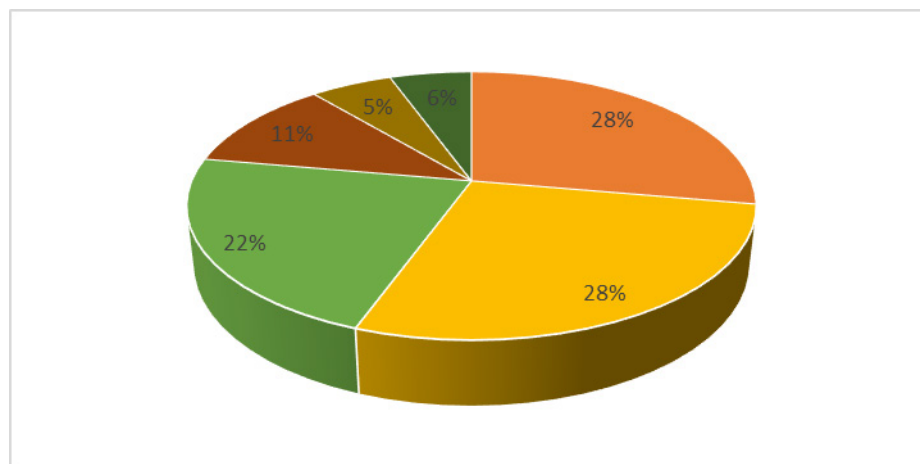


Figure 2 – Distribution of subjects by birth order

33.3% of subjects had a deceased mother, while the remaining 66.7% had a living mother, who generally had a positive influence on her children.

The research work consisted of two stages: at the first stage, subjects, having previously agreed with their siblings, arrived at the designated place and took part in the experiment, conducted using the “Cybernometer” hardware method. At the second stage, subjects were asked to answer a battery of standardized and valid methods. Before the experiment, all subjects signed a voluntary consent to participate in the study and it was revealed that they

were performing tasks on the Cybernometer for the first time.

It should be noted that during the study, the siblings were able to come at the same time, to a certain place, together, take part in the experiment and, by answering the provided questionnaires, rethink their relationship with their sibling, remember that they are brothers and sisters born from the same parents. Following the daily hustle and bustle, unfortunately, people forget that they have real loved ones who are always ready to lend them a helping hand and support.

At the initial stage of the study, the technical device cybernometer of Professor N.N. Obozov was used, or rather, its modern modified version No. 16 – model R. Lambert – prof. N.N. Obozov – V.S. Beloly, abbreviated – “Cybernometer – model LOB No. 16”. The

device has two sides, which imply two modes of its operation: “Maze” is designed to study the psychomotor coordination of two or more people, while “Matrix” is designed to study the cognitive coordination of teams. They are clearly shown in Figure 3.



Figure 3 – Working surfaces of the cybernometer version 16: “Maze” and “Matrix”

In order to maintain the reliability of the experiment, all pairs of siblings were given the same tasks, which were performed on the cybernometer “maze”. The procedure is as follows: the “maze” must be completed three times with three different instructions (the first circle – “as accurately and as quickly as possible”, the second circle – “as quickly as possible”, the third circle – “as accurately as possible”). Touching the metal edge of the “maze” is recorded as an error. Before each circle, the participants make an assumption about how long it will take them to complete the “maze” and with what number of errors.

The cybernometer device can not only help in organizing joint activities, but also provide objective quantitative data on the processes and features of joint activities. The cybernometer has previously been used in various areas of psychological science, including in working with sports teams, in training pilot crews, even in training astronauts, etc. How-

ever, there are no scientific works in which the cybernometer would be used in the study of sibling relationships in the family (Beloly, 2021).

As for standardized questionnaires, we used the following methods: 1. “Adult Sibling Relationship Questionnaire” (ASRQ; R.P. Lanthier, C. Stacker) (adapted by O.V. Almazova); 2. Diagnostics of Sibling Relationships (Yu.E. Aleshina, L.Ya. Gozman, E.M. Dubovskaya, modified by M.V. Kravtsova) (DSR) (Kravtsova, 2003); 3. The Sibling Questionnaire (S.A. Graham-Bermann, S.E. Culter) (adapted by M.V. Kravtsova) (Kravtsova, 2001; Graham-Bermann, Cutler, 1994).

The ASRQ questionnaire was developed in 1992 by Lanthier R.P., Stacker C. and has since been translated into many languages, including German, French, Spanish, Russian, etc. (Lanthier & Stacker, 1992). We used the Russian version of the ASRQ adapted by O.V. Almazova. This extensive questionnaire identified the characteristics of

sibling relationships using 14 different scales. The DSR method is designed to determine trust, mutual understanding, similarity of views, and ease of communication between siblings. The Sibling Questionnaire is used for psychometric assessment and identification of normal and dysfunctional sibling relationships. That is, with the help of the questionnaire, it is possible to identify highly conflictual relationships and relationships in which aggressive behavioral reactions are manifested.

In order to identify significant differences between the groups of subjects, we used the specialized IBM SPSS Statistics version 23 program. The following tools were used: Mann-Whitney U-test, Pearson correlation coefficient, Spearman rank correlation coefficient.

Results and discussion

The total sample was divided into conditional groups depending on the age differences between the siblings: Group 1 is a group of subjects with a minimal age difference (0-3 years); Group 2 is a group of subjects with an average age difference (4-6 years); Group 3 is a group of subjects with a significant age difference (7 years or more). To identify significant differences between the above groups, we used the non-parametric Mann-Whitney U-test, since the categories were compared in pairs.

When examining the results using the "cybernometer" hardware, it was found that there were no significant differences between groups 1 and 2 of subjects. However, significant differences were found between groups 1 and 3 ($p \leq 0.05$), that is, the results of pairs of siblings of group 1 (with a minimum age difference) differ significantly from the results of pairs of siblings of group 3 (with a maximum age difference). At this stage, the study showed that in siblings with a minimum age difference, psychomotor coordination differs significantly from siblings with a maximum age difference.

The data obtained using the ASRQ method were first compared by gender. The comparison showed the existence of significant differences between the data of men and women on the scales: Acceptance, Admiration, Antagonism, Competition ($p \leq 0.05$). This means that men and women interact differently with their siblings: in women, antagonism and competition with their siblings is less noticeable than in men. The study also showed that there are significant differences between groups 1 and 3 on the scales of Similarity, Acceptance, Puzzlement, Admiration, etc. ($p \leq 0.05$). There are also significant

differences between the data of groups 2 and 3 on similarity, acceptance, puzzlement, admiration, etc. ($p \leq 0.05$). No significant differences were found between groups 1 and 2. This means that the age difference between siblings has different effects on their relationships with each other.

According to the data obtained using the questionnaire "Diagnostics of Sibling Relationships (DSR)", there are no significant differences on the scale "Trustworthiness of Communication" between the respondent's assessment of themselves and the respondent's assessment of their partner, that is, the degree of trust between siblings is assessed equally. The more the subject sibling trusts their sibling in the relationship, the more they believe that their sibling trusts them. The scale "Mutual Understanding" between siblings shows how well siblings understand each other, how well one understands the interests, mood, behavior of the other. And according to this indicator, no significant difference was found between the respondent's assessment of themselves and the respondent's assessment of their sibling. In the course of the study, no significant differences were found between the indicators on the scales "Similarity of Views", "Common Symbols of the Family", "Ease of Communication" and "Psychotherapeutic Communication".

The Empathy scale shows siblings' mutual understanding, care for each other, mutual common interests, knowledge of what their siblings are thinking, compassion for each other, a sense of spiritual closeness, a desire to spend more time together, and emotional attachment. When comparing these groups by age difference, it turned out that in groups 1, 2, and 3, the level of empathy is high, and there are no significant differences between these groups. Respondents in these groups do not often have to face conflict situations, because their parents paid equal attention to them and they understand each other well.

The Boundary Maintenance scale shows the degree of support for siblings' interpersonal boundaries, each other's material property, and involvement in personal interests. By diagnosing respect for the physical and psychological space of their sibling, their closeness or divergence with each other is revealed. In groups 1 and 2, the level of boundary maintenance is very low, and there are no significant differences between these groups in this indicator. And in group 3, the maintenance of boundaries is slightly higher. When comparing groups 1 and 3, no significant differences were found. It was found that there are significant differences between the bound-

ary maintenance indicators of groups 2 and 3 ($p \leq 0.05$). Therefore, the greater the age difference between siblings, the more the siblings learn to communicate without violating each other's personal boundaries.

The "Similarity" scale determines whether siblings have common, similar life experiences and interests. It was found that in groups 1, 2 and 3, the similarity between siblings was moderate. In other words, siblings demonstrate an average similarity between themselves, despite the age differences between them, and we can talk about an average amount of differentiation in them. The next scale on this questionnaire, "Coercion", allows us to determine dominance in sibling relationships, the level of power and control of one over the other. In group

3, this indicator is also at a low level and no significant differences were found when comparing the group indicators. It can be said that all siblings who took part in the study have good relationships, they do not dominate each other and do not control each other. When checking the significant correlation coefficients between the success rate, which were obtained using the cybernometer device, and the data of the ASRQ scales, significant correlations were found (Table 2). The data obtained when performing the task "as quickly and as accurately as possible" are interconnected with instrumental support and knowledge of their sibling. Siblings who know each other well, provide not only emotional but also instrumental support to their sibling, and can effectively perform joint tasks.

Table 2 – Correlation of Success Rate (Cyberometer) and ASRQ data (Pearson Correlation)

	Instrumental support	Knowing one's sibling
Q when working Faster / More accurate	.684*	.702*

*. Correlation is significant at the 0.05 level (two-tailed).

When checking the significant correlation coefficients between the success rate and the data of the DSR scales, a significant correlation was found (Table 3). The data obtained when performing the task with the given condition "as quickly

and as accurately as possible" are interconnected with mutual understanding between siblings (the respondent's assessment of self). Siblings who understand each other well can effectively perform joint tasks.

Table 3 – Correlation of the success rate data (cybermeter) and DSO (Pearson correlation)

	Mutual understanding between siblings (respondent's assessment of themselves)
Q when working Faster / More accurate	.676*

*. The correlation is significant at the 0.05 level (two-tailed).

No significant correlation coefficients were found between the success rate and the data from the Brother-Sister Questionnaire scales.

Table 4 shows the relationships between the ASRQ and DSR data (according to Spearman correlation) (Table 4). Almost all the ASRQ scales significantly correlate with the DSR scales. The scales similarity, acceptance, puzzlement, admiration, emotional support, instrumental support, closeness scale, knowledge of one's sibling significantly correlate with the trust in communication, mutual un-

derstanding between siblings, with the similarity of siblings' views, with common family symbols, with the ease of communication, with the psychotherapeutic nature of communication. The dominance scale correlates with the trust in communication, mutual understanding between siblings, with common family symbols, and with the ease of communication between siblings. And the competition scale significantly correlates only with the psychotherapeutic nature of communication scale. The quarreling scale correlates with the trust in communication

(when the respondent evaluates the partner). These findings suggest that the Adult Sibling Relationship Questionnaire (ASRQ) and the Diagnostics of Sib-

ling Relationships (DSR) complement each other very well. Using them together in research provides more data on sibling relationships.

Table 4 – Relationships between questionnaire data (Spearman correlation)

DSR ASRQ	Trust in communication		Mutual understanding between siblings		Similarity of views of siblings	Common symbols of family	Ease of communication between siblings	Psychotherapeutic communication
	a	b	a	b				
Similarity	.865**	.686**	.909**	.805**	.803**	.947**	.877**	.703**
Acceptance	.587*	.468*	.762**	.600**	.825**	.804**	.715**	.543*
Puzzlement	.789**	.590**	.689**	.749**	.777**	.749**	.713**	.845**
Admiration	.815**	.495*	.720**	.687**	.597**	.702**	.789**	.755**
Emotional support	.840**	.678**	.750**	.870**	.782**	.807**	.734**	.834**
Instrumental support	.709**	.650**	.742**	.720**	.689**	.735**	.733**	.688**
Closeness	.841**	.700**	.771**	.683**	.743**	.792**	.752**	.611**
Knowledge of sibling	.869**	.666**	.759**	.755**	.662**	.867**	.753**	.659**
Dominance	.633**	.696**	.471*	.499*		.550*	.579*	
Competition								-.506*
Quarreling		.638**						

Legend: * – correlation is significant at the 0.05 level; ** – correlation is significant at the 0.01 level.

Table 5 shows the relationships between the ASRQ and Sibling Questionnaire data (using Spearman correlation) (Table 5). Almost all ASRQ scales significantly correlate with the Empathy and Similarity scales of the Sibling Questionnaire. The similarity, acceptance, puzzlement, admiration, emotional support, instrumental support, closeness scale, and knowledge of one's sibling scale significantly correlate with the empathy and similarity scale. The

similarity scale is present in both questionnaires, so their relationship proves that there are no false or socially desirable answers in the respondents' answers. The dominance scale correlates only with the empathy scale. It should be concluded that the data from the Adult Sibling Relationships Questionnaire (ASRQ) and the Sibling Questionnaire complement each other very well. Their joint use in research also provides more data on sibling relationships.

Table 5 – Correlations between ASRQ and Sibling Questionnaire data (Spearman correlation)

ASRQ	Empathy	Similarity
Similarity	.753**	.768**
Acceptance	.533*	.797**
Puzzlement	.942**	.566*
Admiration	.759**	.494*
Emotional support	.885**	.592**
Instrumental support	.761**	.519*
Closeness	.835**	.600**
Knowledge of sibling	.824**	.749**
Dominance	.547*	

Legend: * – correlation is significant at the 0.05 level; ** – correlation is significant at the 0.01 level.

Table 6 shows the relationships between the DSR data and the Sibling Questionnaire (using Spearman correlation) (Table 6). Almost all DSR scales significantly correlate with the empathy and similarity scales of the Sibling Questionnaire. The scales of trust in communication (respondent's assessment of self), mutual understanding between siblings (respondent's assessment of self), mutual understanding between siblings (respondent's assessment of their partner), similarity of views of sibling, the scale of common family symbols, ease of communication between siblings and the scale of psychotherapeuticity of communication significantly correlate with the empathy

and similarity scale. The similarity scale is present in both questionnaires (in the Sibling Questionnaire – similarity, in the DSR – similarity of views of brother and sister), therefore their relationship proves that there are no false or socially desirable answers in the respondents' answers. The trustfulness of communication scale (respondent's assessment of their partner) correlates only with the empathy scale. Therefore, it can also be concluded that the Diagnostics of Sibling Relationships (DSR) and the Sibling Questionnaire complement each other well. Their combined use in research provides more data on sibling relationships.

Table 6 – Correlations between the data of the DSO questionnaire and the Sibling Questionnaire (Spearman correlation)

DSR	Empathy	Similarity
Trustfulness of communication (respondent's assessment of self)	.821**	.654**
Trustfulness of communication (respondent's assessment of the partner)	.512*	
Mutual understanding between siblings (respondent's assessment of self)	.714**	.661**
Mutual understanding between siblings (respondent's assessment of the partner)	.774**	.698**
Similarity of views of brother and sister	.747**	.685**
Common symbols of the family	.785**	.835**
Ease of communication between siblings	.725**	.593**
Psychotherapeutic nature of communication	.831**	.520*

Legend: * – correlation is significant at the 0.05 level; ** – correlation is significant at the 0.01 level.

Conclusion

Based on the results of the pilot study, the following conclusions were noted and formulated. The psychomotor coordination of siblings with a minimal age difference (up to 3 years) differs from that of siblings with a greater age difference (from 7 years). Siblings of similar ages showed improved results when completing tasks on the cybernometer: they made fewer mistakes and more accurately predicted the time it would take to complete the track. At the same time, the greater the age difference between siblings, the less they violate each other's personal boundaries when communicating. It was found that men and women perceive their siblings differently. Female subjects are more accepting and admire their siblings. Male subjects compete more often with their brothers and sisters; antagonism is possible in relationships.

Siblings who trust their siblings believe that their siblings trust them too. It was noted that siblings

evaluate similarities of views, common symbols of the family approximately equally, they equally evaluate the ease of communication with each other and the psychotherapeutic nature of communication. Siblings who understand and know each other well, provide not only emotional but also instrumental support to each other, and can effectively complete joint tasks. At the same time, the magnitude of differentiation is average – they consider themselves similar to each other. Also, no dominance of some siblings over others was revealed, and almost all subjects believe that they do not control their brothers and sisters.

All pairs of siblings who participated in our study rarely enter into conflict situations. In our opinion, this is due to the peculiarities of relationships and upbringing in the parental family, where they all received sufficient amount of attention. On the other hand, we encountered a large number of refusals to participate in the experiment, which were motivated by the unwillingness to come with

a brother or sister. Siblings who were in conflict with each other did not take the initiative to improve their relationships by participating in the study together and did not want to see each other at all. And those siblings who did not have obvious conflicts, but did not have very good relationships with each other, looked for and found various reasons not to participate in the study and the experiment.

During the pilot study, results were obtained that confirmed the suitability of the cybernometer experiment, the ASRQ, DSR and Sibling Questionnaires for our study. The above-mentioned methods complement each other well. Their joint use in research provides more data on sibling relationships. It should be noted that the results of the joint activities of siblings obtained with the help of the cybernometer are a new milestone in the study of sibling relationships in Kazakhstani science.

The pilot study made it possible to understand that we are on the right track. The data on the methods complemented each other, and this gave confidence in the correctness of the methods chosen for the research work. In the future, when conducting the main experiment, we will be guided by the data obtained in the pilot study. The hypotheses that there are differences in relationships between siblings depending on gender and the age difference between them were also confirmed. The value of our study is that for the first time a study of sibling relationships was conducted using mixed methods, including an experiment with the cybernometer device. The methodological approach used with the use of a mixed research method turned out to be quite justified. And the data we obtained during the pilot study confirmed the correctness of the selected methods and research techniques, and also confirmed our hypothesis.

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