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Article

Reshaping Social Capital During the Pandemic Crisis: Age Group Differences in Face-to-Face Contact Network Structures

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Abstract
This article presents findings about the impact of the first Covid-related lockdown on the face-to-face (FTF) interpersonal contact networks of the Hungarian adult population. Our primary objective is to understand how the size, composition, and quality of such networks have changed. We base our analysis on the contact-diary method. Our data were collected from two representative surveys of the Hungarian adult population: one in 2015 (N = 372) and one in May 2020 (N = 1001) during the first wave of the Covid-19 epidemic. No decline in the overall bonding social capital can be detected; however, social isolation has increased. A restructuring has occurred: a considerable increase manifests in the proportion of kin ties, especially children, and a decrease in the importance of non-kin ties, with a particularly sharp decline in friendships. FTF contacts indicate an increased emotional intensity (except for non-kin, non-household members) and an increase in the length of conversations, but there is a decrease in the frequency of meeting alters. The changes wrought different effects on different age groups, with the restrictions most negatively affecting the size of FTF contact networks for respondents aged 60 years or older. Our findings point to the stability and resilience of close family relations, yet the doubling of social isolation as early as May 2020 underlines fears about the pandemic's potentially detrimental effects on social connectedness. The decline in friendship ties (and most probably in other weak ties) may lead to a reduction not only in the amount and scope of accessible social capital but also to a weakening social integration.

Keywords
age groups; contact diary method; Covid-19; epidemic-specific social capital; face-to-face contacts; social isolation

Issue
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1. Introduction

In this unprecedented situation caused by Covid-19, it remains questionable how the population can maintain physical contact. It is a scientifically proven fact that social relationships are a capital—a necessary prerequisite—for a healthy and happy life (e.g., Bian et al., 2020; Cacioppo & Cacioppo, 2014; Helliwell et al., 2015; Uchino, 2004), and that loneliness produces detrimental effects on well-being (Bzdok & Dunbar, 2020). In general, the more extensive and diverse one's interpersonal network is, the better. The situation of mass crisis epitomized by the Covid-19 pandemic, the daily instrumental and emotional coping needs associated with it—either because of actual lockdown measures or because one was/is quarantined or sick—and the mental toll it lays on people, significantly increase one's needs for such supportive resources. On the other hand, as the coronavirus spreads via personal contact, social distancing thus becomes the primary means of coping with the

threat. Both short- and long-term effects of the pandemic are likely to leave their mark on the structure of interpersonal relationships.

Based on two nationally representative surveys carried out in 2015 and 2020, this article provides insights into how the first wave of restrictive measures affected face-to-face (FTF) contact among the Hungarian adult population. We analyze the overall changes in personal social networks (more precisely egocentric contact networks) as well as specific differences in various age groups. Moreover, we aim to measure the effects on the intensity and quality of FTF contacts during the lockdown.

Various approaches exist to define social capital: They might highlight the importance of family, friends, and community relationships, membership in civic organizations, as well as values and norms such as solidarity and trust (van Oorschot et al., 2006). Social capital is embodied in relations between individuals (Albert & Hajdu, 2016). The existence of social ties and the size composition of personal networks affect the individual's daily life; moreover, these define the available resources. Social networks operate at the meso level between the individual and society, and this operation determines how the individual gains access to various goods, resources, and other groups or institutions using their personal network. Bourdieu (1986) and Coleman (1988) call these types of resources social capital. According to Lin (2008), social capital refers to resources that can be accessed and mobilized through relationships. He conceptualized social capital from a network perspective at the level of the individual (Lukács & Dávid, 2019). Based on the intensity and reciprocity of social ties, Lin distinguishes three forms of social bonding: (a) binding, (b) bonding, and (c) bridging. The article concentrates primarily on bonding and cohesive ties: These relationships form a relatively closed and socio-demographically homogenous group, as members share resources and information. Weak ties can also emerge among bonding ties (Lin, 2008). Examining daily contact during the pandemic, we may learn how social distancing measures—more precisely those limiting physical contact—impact the structure of FTF relations and what kind of ties can survive in such unusual situations. Moreover, it offers the possibility to detect changes in social solidarity.

We built the theoretical framework of our study on Bian's (2020, p. 2) concept of epidemic-specific social capital, which "refers to the social resources that are generated from the networks of ongoing social relations under conditions of physical isolation in a situation such as the Covid-19 pandemic." Bian (2020) defined epidemic-specific social capital as the intensity and extensity of a person's social connectedness under special conditions. It is worth highlighting that, from this aspect, social capital strengthens a person's intimate circles and, at the same time, it promotes maintaining connections with distant alters (i.e., one's contact person) via online platforms. The conceptual structure of epidemic-specific social capital has two internal conditions (intimate circle, distant alters) and one external one (physical isolation). From the two "internal constructs" of epidemic-specific social capital Bian identified, we focus predominantly on bonding social capital, namely, the FTF contacts that compose an individual's intimate circles—mostly close family relations as well as other kin and pseudo-kin ties. In the case of the second construct (distant alters) that is bridging social capital, we also only focus on FTF contacts.

2. The Impact of the Covid-19 Pandemic on Interpersonal Relationships

Several scientists (see, e.g., Clair et al., 2021) have already warned the public of the potential dangers social distancing engenders and recommended a more precise and desirable formulation, i.e., physical distancing and social solidarity. Several studies review the existing literature and propose conceptual frameworks for analyzing the pandemic's possible effects (on the well-being of families and children see, e.g., Prime et al., 2020; on the life course implications of one's being infected with Covid-19 see Settersten et al., 2020). There is a growing body of empirical evidence concerning the actual impact of the first wave of the Covid-19 pandemic on relationships. In line with the quarantine measures, several countries have reported a drastic reduction in interpersonal contacts. For example, in the UK, Jarvis et al. (2020) found a 74% reduction in the average observed daily number of contacts in late March 2020. Zhang et al. (2020), who analyzed contact survey data from Wuhan and Shanghai before and during the epidemic's outbreak, also indicated that daily contacts were reduced seven to eightfold during the Covid-19 social distancing period, with most interactions confined to the household. Age also seemed to have a crucial impact on personal network structures during the pandemic period. In France, a significant difference manifested itself between younger and older age groups: The average number of contacts was 1.7 for respondents aged 65 and over, compared to 3.6 for younger respondents (Bosetti et al., 2021). In Luxembourg, Latsuzbaia et al. (2020) also reported that contacts were reduced by more than 80% during the first wave lockdown: The average number of contacts decreased with age, from 4.2 for participants under 25 years of age to 1.7 for participants over 64 years old.

The first lockdown's negative effects are not only a concern for the older population, but also for younger and middle-aged people. Bu et al. (2020) examined the loneliness levels of almost 40 thousand adults from the UK and identified young people and women to be especially at risk of loneliness, their main protective factors being (a) living with others, (b) the number of friends that they had, (c) and access to social support. On a Dutch panel survey data, Völker (2023) compared the core discussion networks and the networks of practical helpers of young (18–35 years) and old (65+ years)

respondents in May 2019 and 2020: They concluded that the size of both network segments decreased and that especially the younger sample experienced network decay in the core discussion network. For the core discussion networks, reliance on partners increased significantly in the case of the aged and children. In both age groups, people leaned on those they were already close with, while weaker ties faded away. A panel study in the USA comparing data from June 2019 to June 2020 found that the number of close alters did not change significantly. However, network composition did: The number of close friends and workmates decreased while that of family members increased (Kovacs et al., 2021). Between March and June 2020, Lambert et al. (2021) gathered data on the French adult population via a quota sample supplemented with interviews and found growing gender inequalities resulting from the pandemic: Although two-earner families are the most widespread in France, mothers (among others) tended to decrease their engagement in free-time activities so that, even controlling for a number of socio-demographic characteristics, the presence of children in the household affected their lifestyles to a greater extent. A comparative study in several European countries concluded that lockdowns affected those born between 1994 and 2001 more than older age groups (Kaspersky, 2020). Other surveys also found that social distancing, school closures, and lockdowns affected young people more than other age groups (Eurofound, 2020). Hence, in terms of both coping and resilience, as they seek to return to normal, young people struggled more than older age groups. Young respondents (and the unemployed) were the most likely to feel excluded from society.

The pandemic is expected to impact not only the size of one's network but also its quality. Schmid et al. (2021) analyzed the change in employment status (home office and short-time work) that happened during the crisis and its impact on levels of satisfaction in cohabiting couples' relationships. The researchers found that a significant proportion of respondents experienced positive (20%) or negative (40%) changes in their relationships. These results support previous claims that the Covid-19 pandemic, in general, poses a threat to the quality of relationships and family health (e.g., Balzarini et al., 2022; Biroli et al., 2020). Balzarini et al. (2022) showed in a cross-sectional convenience sample that financial strain, social isolation, and perceived stress related to Covid-19 stand negatively associated with the quality of relationships. Up till now, however, no studies have been published representing the impact of the first wave on personal network structures in Central Eastern Europe.

3. Hypotheses

Compared to 2015, in 2020, and based on the epidemic-specific social capital framework, we expect that lockdown interventions affected FTF contact networks in the following ways:

H1: The average number of FTF contacts decreased, and the proportion of physically isolated respondents (without any FTF contacts) increased. Thus, we expect an overall decline in the level of bonding social capital and a higher rate of social isolation.

H2: Within bonding social capital, kin and non-kin relations are affected differently. With close family relations being more accessible, we assume that an increase exists in the average number of such contacts, while in the average number of non-kin contacts, we foresee a significant decrease. We thus expect a divergence in the impact of bonding social capital.

H3: During lockdowns, the intensity of FTF contacts changed. Emotional intensity will increase because people will appreciate their contacts more (i.e., how much the respondent liked the contact). The two indicators of physical intensity (length and frequency) will change differently. Being at home gives people the opportunity to spend more quality time together, so the average length of the FTF interactions can be expected to increase. On the other hand, as people are not allowed to leave home, the frequency of FTF interactions (i.e., how often respondents meet with the same person) will decrease.

H4: Lockdown interventions have affected people's lives differently. Young people were discouraged from socializing and going out with friends and acquaintances. Middle-aged people were overburdened with multiple tasks both at work and at home. Older people were prevented from visiting public places, meeting friends, and physically accessing public services. Therefore, we expect the impact of Covid-19-related restrictions to vary across age groups. We expect a decrease in the number of daily FTF contacts of younger and older age groups and an increase in the number of contacts regarding middle-aged people.

4. Method and Data

4.1. Contact Diary

In this article, social capital is defined from an ego-centric approach, as an individual's relationship with others (Shin, 2021). Ego-centred social network research especially focuses on different types of relationships (Van Der Gaag & Webber, 2008). Besides the various generator methods (name-, position-, or resource-generators), the diary approach remains a very fruitful tool to measure egocentric networks: "If network researchers want to understand an active personal network within a specific period of time, the diary approach that records all contacts with all kinds of persons yields all necessary and complete contact records" (Fu, 2007, p. 208). The contact diary method asks respondents to track

and record all their interpersonal contacts (interactions) over a given period. It measures daily contacts directly and comprehensively, reconstructing the components of the personal networks that are active and adequate in everyday life (Albert et al., 2020; Dávid et al., 2016; Fu, 2005, 2007; Huszti et al., 2013; Lukács & Dávid, 2019). Revealing the daily contacts of egos, a contact diary provides information on the size and composition of personal social networks. Furthermore, it provides diverse information about the individuals' contact with others. According to Bian's (2020, p. 2) theory, epidemic-social capital includes measuring "the intensity and the extensity of a person's social connectedness." The size and composition of personal networks and the frequency of interactions stand as crucial indicators of social capital during the pandemic situation. Social interactions and contact with others have been essential issues in sociological research (Durkheim, 1964; Fu & Hsuan-Wei, 2020). In everyday life, it is normal that people have interpersonal contact with each other (Fu & Hsuan-Wei, 2020). Focusing on FTF contacts, this article examines the changes in interpersonal ties during the pandemic situation, as these embody the links between individuals and society. Differing from the relationships-based approach, Fu and Hsuan-Wei (2020) proposed the contact-based approach. The latter uses "actual contacts among individuals and it measures the social interactions….[It] thus helps us to reconstruct social life more extensively and precisely" (Fu & Hsuan-Wei, 2020, p. 435).

Our data were collected from two different nationwide representative surveys of the Hungarian adult population. The Institute of Sociology of the Hungarian Academy of Sciences and the TÁRKI Social Research Institute conducted the first survey (N = 372) in 2015 (Kovách et al., 2017). The Szinapszis Market Research and Consulting Ltd. (Koltai et al., 2022) conducted the second survey (N = 1001) in May 2020. A multi-step, proportionally stratified, probabilistic sampling procedure was elaborated and implemented in both surveys. Both samples are representative of the Hungarian population aged 18 or older by gender, age, education, and domicile. Data collection was implemented by CAPI survey methodology in 2015 and by CATI survey methodology in 2020.

In 2020, the contact diary survey was a repetition of the 2015 study (for the diary log used at both times see Supplementary File 1), with only one difference: In 2015, respondents listed all interactions for two consecutive days as opposed to 2020, when respondents had to focus only on the day before data collection.

The diary log consisted of three major parts: (a) the type and the place of interaction; (b) the individual and socio-demographic characteristics of the contacted person; and (c) the characteristics of the interaction. The diary logs were divided into three time periods (morning, afternoon, and evening) in 2015, and four time periods in 2020 (midnight to 8 a.m., 8 a.m. to noon, noon to 6 p.m., 6 p.m. to midnight) to make it easier to record multiple interactions with the same contacted person. In both years, the recorded interactions were thoroughly defined to include practically all meaningful interactions, except those that were too short and did not go beyond a greeting. In the contact diary, participants recorded all kinds of contacts occurring FTF, whether over the phone (voice or text messages) or online (email, chat). Regarding building on the theoretical framework, however, in this article, we only deal with FTF contacts and ignore other forms of social interactions such as virtual or computer-mediated communication.

5. Analytical Strategy

Data collection, based on the contact diary, proceeds on different levels: Some questions refer to the level of interactions between the respondent and their contact person (such as the alter; e.g., the length of the conversation or the location of the meeting), while others involve the contacted alters (e.g., frequency of meetings, type of relationship, emotional intensity; see Supplementary File 1). Since we were interested in changes regarding the network characteristics of the respondent (ego), we aggregated all data at the ego level by count (e.g., number of contacted alters in public), mean (e.g., the average length of longest conversations with alters), and by creating dichotomous variables, namely: whether the ego met the given alters in public (*yes*/*no*) or whether the ego met any kin alters (*yes*/*no*). For the mean, the data were aggregated in two steps: First, the value of the longest conversation was selected for each alter and then the mean value of the longest conversations with alters was computed for each ego. Furthermore, combined variables were also calculated to investigate specific groups of alters to ego (e.g., mean length of longest conversations with kin alters). Table 1 summarizes the different levels and the process of aggregation.

Table 1. Different levels of analysis in the contact diary and the steps of aggregation.

Levels of analysis	Described characteristics	Examples
Level 3	characteristics of ego	ego met a given alter in public (*yes*/*no*); number of alters met in public; mean length of longest conversations with alter, mean frequency of meetings with alters
Level 2	characteristics of alter	ego met alter in public (*yes*/*no*); longest conversation with alter, frequency of meetings
Level 1	characteristics of interactions	place of meeting; length of conversation

In the results section, we first describe dichotomous variables and compare data from 2015 and 2020 based on descriptive statistics. The size of the personal network, i.e., the number of alters, reflects the number of individuals listed in the contact diary as FTF, physical contacts. The composition of the network was measured by (a) the number of kin relations, (b) the number of non-kin relations, and (c) the proportion of different types of relationships. Regarding FTF physical interactions, we also analyzed the location of the interaction. The physical intensity contact measures included the frequency and the length of FTF contact, while the emotional intensity measures referred to how much the ego liked the alter (see the diary log in Supplementary File 1).

We applied a non-parametric Mann-Whitney U test to our data. To avoid the problem of multiple comparisons, our results were adjusted by Bonferroni correction, which can also be applied to non-parametric procedures such as the Mann-Whitney test (Shaffer, 1995). The results of the Mann-Whitney tests were tested against a Bonferroni-corrected level of significance.

6. Basic Characteristics of the Data

Both datasets were weighted for gender and age groups based on the 2016 Hungarian microcensus. The ratio of males stood at 46.9%. The age group distribution was as follows: 17.6% for 18 to 29-year-olds, 17% for 30 to 39-year-olds, and 18.8% for 40 to 49-year-olds. The smallest age group consisted of those aged 50 to 59 (15%), while the largest comprised the ones aged 60 and over (31.5%). We applied no other weighting dimensions due to the small sample size in 2015.

The ratio of respondents having lower education stood higher in 2020 (22% vs 17%), while in 2015, the ratio of respondents with secondary education stood higher (see Table 2). Chi-square test statistics, however, show no significant differences between the two examined years at the .05 significance level (X^2 (2, N = 1373) = 5.655, p = .059).

In terms of household size, the proportion of respondents living alone remained the same, around 20%. Interestingly, there seems to have been a shift from

Table 2. Socio-demographic characteristics of respondents.

	2015		2020	
	N	%	N	%
Education				
Elementary or lower	62	16.6	216	21.6
Secondary	232	62.4	558	55.7
Higher education	78	21.0	227	22.7
Household size (without ego)				
0	79	21.2	202	20.1
1	138	37.1	299	29.9
2	87	23.3	207	20.7
3	33	8.9	171	17.1
4	22	6.0	84	8.4
5	9	2.5	23	2.3
6+	4	1	16	1.5
Type of settlement				
Capital city	81	21.8	189	18.9
County towns	62	16.6	178	17.8
Other towns	124	33.2	369	36.9
Villages	105	28.4	265	26.4
Employment status				
Employed in 2015; worked at least 1 hour in the last week in 2020	212	57.3	535	53.4
Unemployed	13	3.5	53	5.4
Temporarily not working due to coronavirus	—	—	27	2.6
Retired	110	29.6	256	25.6
On parental leave	12	3.3	40	4.0
Student	19	5.2	23	2.3
Other inactive	4	1.1	68	6.7
Total	372	100	1001	100

smaller households of two or three persons to households of four people in 2020; this proportion almost doubled in 2020 (from 9% to 17%). The differences are statistically significant (X^2 (6, N = 1374) = 20.529, p = .002, C = .122). It seems likely that children studying elsewhere and no longer living with their families moved home temporarily during the lockdown. The average household size (ego included) increased significantly between 2015 and 2020, from 2.53 to 2.73 ((Mdn_{2015} = 1; Mdn_{2020} = 2) $U(N_{2015}$ = 412, N_{2020} = 1001) = 187748.5, z = −2,7256, p = .006, rg = .08). The differences in employment status clearly reflect how the lives of workers have changed during the restrictions. We see a minor increase in the rate of the unemployed (including those who were temporarily out of work due to the coronavirus) and in the group of the other inactive (from 1.1%, it increased to 6.7%). Differences in employment status cannot be compared statistically, as the questions were asked in slightly different ways concerning the two years. No statistically significant difference exists between the two years regarding the type of settlement (X^2 (3, N = 1373) = 2.598, p = .458), as per Table 2.

7. Results

7.1. Face-To-Face Personal Network Characteristics

Although the range in the number of alters (Min_{2015} = 0, Min_{2020} = 0; Max_{2015} = 14; Max_{2020} = 21) mentioned and the standard deviation (SD_{2015} = 2.26; SD_{2020} = 2.84) values differ, the mean (M_{2015} = 2.9, M_{2020} = 2.9) and median (Mdn_{2015} = 2; Mdn_{2020} = 2) number of FTF contacts (number of contacted persons per day) did not change. The average size of the FTF network stood at 2.9 both in 2015 and 2020. The difference is also not significant based on the Mann-Whitney U test ($U(N_{2015}$ = 412, N_{2020} = 1001) = 193862.5, z = −1,790, p = .073). Based on these results, we reject the first part of H1 where we hypothesized that the average number of FTF contacts would decrease during the pandemic. When we analyze the ego's FTF network composition in more detail, the picture becomes much more diverse (see Table 3).

In 2020, the ratio of socially isolated respondents, i.e., those who did not mention any FTF contacts on the day of the survey, doubled from 10 to 20%. Based on Chi-square statistics, these differences are significant (X^2 (3, N = 1366) = 50.576, p = .000, C = .192). During the lockdown, people became socially more isolated than before, confirming the 2nd part of H1, where we hypothesized that the proportion of physically isolated respondents (without any FTF contacts) would increase.

If we focus on the different bonding types—that is, close familial and non-familial ties—we find a reconstruction of some kind. A considerable increase appears in the proportion of respondents who mentioned kin ties only (from 25% to 37%) and a decrease in the proportion of those who met solely non-kin alters (from 18% to 13%). In 2020, a larger proportion of respondents had FTF contact with their children (an increase from 28% to 35% respectively), while the proportion of those who mentioned FTF friendship ties dropped from 26% to 8%. These findings are in line with our expectation that the impact on bonding social capital varies depending on the type of the relationship: Kin ties became more prevailing while non-kin ties became less important. H2 is, therefore, verified.

Results show that the three measures of relationship intensity (emotional intensity, or how much ego likes alter; physical intensity 1, i.e., the mean length of conversations with the alter; and physical intensity 2, i.e., the mean frequency of meetings with the alter) varied between 2015 and 2020. The Bonferroni Mann-Whitney U tests show that for each intensity measure, the values reveal significant changes. In 2020, respondents were emotionally more appreciative of those with whom they had FTF contact (Mdn = 5) than in 2015 ((Mdn = 4.5) $U(N_{2015}$ = 388, N_{2020} = 860) = 144770, z = −3.96, p = .000, rg = .13). And unsurprisingly, they spent more time together ((Mdn_{2020} = 3.67; Mdn_{2015} = 3.17) $U(N_{2015}$ = 389, N_{2020} = 860) = 121043, z = −7.86, p = .000, rg = .28) but met less often ((Mdn_{2020} = 6.57; Mdn_{2015} = 6.8) $U(N_{2015}$ = 390, N_{2020} = 860) = 144915, z = −3,880, p = .000, rg = .14). Based on these findings, H3 is verified, as emotional intensity increased during the pandemic while the two indicators of physical intensity changed differently. The mean length of conversation increased, while the frequency of meetings decreased.

A systematic age-specific component emerges in the FTF contact network structures during Covid-19. Table 4 and Table 5 clearly show that the significant changes measured above had various effects on the various age groups, so H4 is also verified. The test statistics suggest that the restrictions mostly affected the FTF networks of respondents aged 60 or older; their contact

Table 3. Ego's face-to-face contact network composition.

	2015 (N = 366)		2020 (N = 1000)	
	N	%	N	%
Isolated (no FTF contact)	38	10	197	20
Kin ties (spouse/partner, parent, child, sibling, other relatives)	90	25	367	37
Non-kin ties (friend, neighbor, colleague, acquaintanceship, other)	66	18	130	13
Both kin and non-kin ties	172	47	306	30

Table 4. Mean number of contacted alters, kin alters, and non-kin alters (per day) by respondents' age group (with Bonferroni Mann-Whitney U tests; only significant values).

Age group	18–29		30–39		40–49		50–59		60+		Total	
	2015	2020	2015	2020	2015	2020	2015	2020	2015	2020	2015	2020
	n = 84	n = 179	n = 72	n = 168	n = 63	n = 188	n = 62	n = 148	n = 131	n = 318	N = 412	N = 1001
total number of alters contacted (mean)									2.55	1.88		
									(U = 15887.5; p = .000)			
number of non-kin alters contacted (mean)							2	1.25	1.44	0.68	1.45	1.18
							(U = 3405; p = .002)		(U = 13796.5; p = .000)		(U = 166050; p = .000)	

Notes: Bonferroni corrected level of significance: $p < 0.01$; N are weighted values.

Table 5. Mean number of contacted alters by respondents' age group and by respondents' relationship to alters (per day) (with Bonferroni Mann-Whitney U tests; only significant values).

Age group		18–29		30–39		40–49		50–59		60+		Total	
		2015	2020	2015	2020	2015	2020	2015	2020	2015	2020	2015	2020
		n = 84	n = 179	n = 72	n = 168	n = 63	n = 188	n = 62	n = 148	n = 131	n = 318	N = 412	N = 1001
Kin	children					0.55	0.94					0.41	0.58
						(U = 4442; p = .001)						(U = 190328.5; p = .006)	
Non-kin	colleagues												
	friends	0.57	0.25	0.32	0.11			0.48	0.16	0.38	0.09	0.39	0.14
		(U = 5442; p = .000)		(U = 5137; p = .001)				(U = 3796; p = .001)		(U = 17295; p = .000)		(U = 168541; p = .000)	
Household members						1.01	1.68	0.72	1.34			0.89	1.23
						(U = 4281; p = .001)		(U = 3305.5; p = .001)				(U = 185416; p = .002)	
Non-household	all alters							3.34	1.87	2.36	1.22	2.40	1.69
								(U = 3183.5; p = .000)		(U = 13485; p = .000)		(U = 157622; p = .000)	
	kin alters											0.55	0.48
												(U = 189414.5; p = .002)	
	non-kin alters							2	1.20	1.44	0.65	1.45	1.12
								(U = 3332; p = .001)		(U = 13510.5; p = .000)		(U = 161956.5; p = .000)	

Notes: Bonferroni corrected level of significance: $p < 0.01$; N are weighted values.

networks were "disrupted" in many ways. This age group saw the most dramatic shrinkage in size: With an average of 0.6 persons "lost" around them compared to 2015, this change is statistically significant ((Mdn_{2015} = 2, Mdn_{2020} = 2) U(N_{2015} = 131, N_{2020} = 318) = 15887.5, z = −4.040, p = .000, rg = .24). There is an even greater decline among non-kin contacts (0,75) ((Mdn_{2015} = 1, Mdn_{2020} = 0) U(N_{2015} = 131, N_{2020} = 318) = 13796, z = −6.321, p = 0.000, rg = .34).

With the exception of respondents aged 40 to 49, people from all other age groups contacted significantly fewer friends (Table 5). On the other hand, the number of contacted colleagues and neighbours did not differ between the two years studied. As with the 50–59 age group, the loss was limited to non-kin ties outside one's household. Generally, people had less contact with family members living outside the household ((Mdn_{2015} = 0, Mdn_{2020} = 0) U(N_{2015} = 412, N_{2020} = 1001) = 189414.5, z = −3.039, p = .002, rg = .08). In this case, there was no specific age effect. We have also experienced changes in the opposite direction (increase in FTF contacts) due to Covid-19 pandemic-related restrictions. The two middle-aged groups (40 to 49 and 50 to 59) mentioned significantly more people in their households. For the age group 40–49, this was: ((Mdn_{2015} = 1, Mdn_{2020} = 1) U(N_{2015} = 63, N_{2020} = 188) = 4281, z = −3.405, p = .001, rg = .28); for the age group 50–59, this was: ((Mdn_{2015} = 1, Mdn_{2020} = 1) U(N_{2015} = 62, N_{2020} = 148) = 3305.5, z = −3.338, p = .001, rg = .28). In the case of 40 to 49-year-olds, the number of contacted children per day also increased significantly ((Mdn_{2015} = 0, Mdn_{2020} = 0) U(N_{2015} = 63, N_{2020} = 188) = 4442, z = −3.257, p = .001, rg = .25). An interesting question is whether this increase exhibits the consequence of their children moving back home during the lockdown or whether these parents "suddenly discovered" or "noticed" their children and simply spent more quality time with them: for example, eating together or watching a movie. Based on Table 5, this increase seems somehow unbalanced: no such increase was recorded in the case of young people (18 to 29-year-olds) mentioning their parents.

Having a reduced possibility to meet in person, the number of young people contacting one another in public places fell dramatically ((Mdn_{2015} = 0, Mdn_{2020} = 0) U(N_{2015} = 84, N_{2020} = 179) = 5763, z = −4.114, p = .000, rg = .24). This had similarly affected the oldest respondents. For the 50–59 age group, this was: ((Mdn_{2015} = 0, Mdn_{2020} = 0) U(N_{2015} = 62, N_{2020} = 148) = 3771.5, z = −2.620, p = .009, rg = .18). For people aged 60 and over, who could not socialize outside their homes or visit each other at home, this was: ((Mdn_{2015} = 0, Mdn_{2020} = 0) U(N_{2015} = 131, N_{2020} = 318) = 16757.5, z = −4.554, p = .000, rg = .20); see Table 6.

Perhaps surprisingly, people in 2020 mentioned slightly but significantly more workplace contacts ((Mdn_{2015} = 0, Mdn_{2020} = 0) U(N_{2015} = 412, N_{2020} = 1001) = 192065.5, z = −2.757, p = .006, rg = .07). In such circumstances, when people suddenly lose all other FTF contacts, they start valuing and recalling contacts that they would not have otherwise mentioned.

8. Discussion

Our analysis aims to extend the existing body of evidence concerning the impact of the Covid-19 pandemic on personal relationships. In Bian's (2020) terminology, we compared a certain segment of epidemic-specific social capital, namely bonding social capital, by comparing the characteristics of the FTF contact networks of the Hungarian adult population to those they had in 2015. Three of the four hypotheses were confirmed and one was partly verified.

We found that despite the restrictive measures, no overall decline in the bonding social capital occurred during the first wave of the Covid-19 pandemic, as measured by the average number of FTF contacts made on a given day. The composition of FTF networks has been restructured, with a considerable increase in the proportion of kin ties and a decrease in the importance of non-kin ties: A higher proportion of the respondents (from 28% to 35% respectively) contacted their children (X^2 (1, N = 1373) = 5.559, p = .018, C = .064), while a lower proportion contacted their friends (from 26% to 8% respectively) (X^2 (1, N = 1374) = 77.871, p = .000, C = .238).

Unfortunately, the prevalence of social isolation has doubled, and indeed, the pandemic may easily be followed by an epidemic of loneliness (Clair et al., 2021). It is worth noting that in 2020, 59% of the respondents who reported no physical interaction on the day of the survey were not living alone. This proportion stood higher (75%) in 2015 (X^2 (1, N = 233) = 3.795, p = .051, C = .128), which may indicate that during the pandemic, people living together 'discover' one another and have more time and opportunities to interact more frequently. When FTF contact could no longer be taken for granted, all of a sudden, people might have realized how important it was, and sought opportunities for such interactions outside their homes and at their workplaces.

Our results may indicate the stability and resilience of strong tie relations: The registered FTF contacts indicate a somewhat increased level of emotional intensity (liking) and length of conversation, but a decrease in the overall frequency of encounters. The observed changes in intensity measures affected various alters in the ego's contact network differently (for a more detailed picture see Supplementary File 2). Respondents spent significantly more time with their close family members, such as spouses, parents, child(ren) and siblings when they lived in the same household, i.e., when they lived together ((Mdn_{2015} = 4, Mdn_{2020} = 5) U(N_{2015} = 217, N_{2020} = 541) = 38551, z = −7.864, p = .000, rg = .34). People were more connected by being confined to their homes; spontaneously or not, they interacted more with their family members. On the other hand, the number of FTF contacts outside the home decreased:

Table 6. Mean number of contacted alters (per day) by respondents' age and the place of meeting (with Bonferroni Mann-Whitney U tests; only significant values).

Age group	18–29		30–39		40–49		50–59		60+		Total	
	2015	2020	2015	2020	2015	2020	2015	2020	2015	2020	2015	2020
	n = 84	n = 179	n = 72	n = 168	n = 63	n = 188	n = 62	n = 148	n = 131	n = 318	N = 412	N = 1001
Shop, public place	0.64	0.2					0.72	0.40	0.60	0.30	0.58	0.36
	(U = 5763; p = .000)						(U = 3771.5; p = .009)		(U = 16757.5; p = .000)		(U = 172566; p = .000)	
Home									1.7	1.29		
									(U = 16370; p = .000)			
Workplace											0.63	0.69
											(U = 192065.5; p = .006)	

Notes: Bonferroni corrected level of significance: $p < 0.01$; N are weighted values.

This had a negative impact on the frequency of meeting family members they are not living together with (Mdn_{2015} = 8, Mdn_{2020} = 6) U(N_{2015} = 145, N_{2020} = 256) = 10111, z = −7.750, p = .000, rg = .45) and non-family contacts such as friends (Mdn_{2015} = 6.5, Mdn_{2020} = 5) U(N_{2015} = 110, N_{2020} = 82) = 2435.5, z = −5.529, p = .000, rg = .46) and colleagues (Mdn_{2015} = 8, Mdn_{2020} = 7) U(N_{2015} = 76, N_{2020} = 163) = 3805, z = −5.007, p = .000, rg = .24). Emotional intensity, which generally increased at the respondent level, actually decreased in one specific case, among non-kin, non-household members (Mdn_{2015} = 4, Mdn_{2020} = 4) U(N_{2015} = 264, N_{2020} = 416) = 48735.5, z = −2.572, p = .010, rg = .11). Because respondents could not voluntarily meet with whom they wanted and liked (i.e., close non-kin ties), the ones they did encounter were emotionally rather neutral to them.

In line with recent studies focusing on the pandemic, we found that restrictive measures affected different age groups differently. International surveys almost unanimously indicate that the size of interpersonal networks is significantly influenced by the age of the ego, e.g., young people dominantly have bigger networks and maintain more friendships than older people (Ajrouch et al., 2005; Albert & Dávid, 2018; Dunbar, 2016; Harling et al., 2018; Hill & Dunbar, 2003; Kohli et al., 2009; van Tilburg, 1998). Data from 2015 showed that in Hungary, while network size decreased with age, the strength of ties increased. Retirement, deteriorating health, and the death of a partner were the main factors responsible for the decrease in network size (Albert et al., 2020). According to Dunbar (2018), young people can be characterized by increased "social promiscuity" as they seek suitable lifelong friends and romantic partners in the widest possible circles, and as they age, particularly with the birth of their children, some of the less homophilous/appropriate relationships disintegrate and resources are increasingly concentrated on maintaining the strongest relationships.

In light of this, it may not come as a surprise that the FTF network of respondents aged 60 or over comprised those most affected by the restrictions, with the most dramatic shrinkage in the size of their FTF contact network. The loss of contacts particularly affected the voluntarily chosen friendship ties: Apart from the respondents aged 40–49, people in all other age groups contacted significantly fewer friends. On the other hand, the number of colleagues and neighbours contacted did not differ between the two years studied, which is not surprising: These ties are simply "given" in the setting we live in.

The lockdown restrictions affected older respondents enormously: They could not socialize outside their homes, nor could they visit each other at home. This was especially distressing for those older than 60 and living alone: In 2015, almost 35% of their FTF contact took place in public places or offices. For such people, non-kin ties, usually acquaintances (various service providers including social sector workers) are the main source to satisfy the needs of belonging.

The increased burden on the sandwich generations is also reflected in their network structure: The two middle-aged groups (40–49 and 50–59) mentioned significantly more people in their households. Other studies highlighted that households had to deal with a significantly increased volume of childcare without much institutional assistance (Fodor et al., 2021) and that elderly parents were often supported by their middle-aged children by running various errands for them so that they could stay at home without the risk of catching the virus.

Over the past decades, we have observed that in core discussion networks the composition has changed, and friendships have become increasingly important. In particular, young people remain less likely to engage in family ties than older people and this effect intensified over time in the period studied, which lay between 1997–2015 (Albert et al., 2021). Changes related to the pandemic may alter this path or may leave younger generations particularly deprived and vulnerable, as their confidants are their friends rather than family members with whom they can maintain FTF contact during lockdowns. The drastic loss of friends from FTF contact networks may also be detrimental to social integration and cohesion, as these ties might provide access to more diverse resources than close family ties. The mental health consequences of social isolation at an early age (for both adolescents and young adults) are unknown, but as longitudinal studies suggest (Yang et al., 2016), social embeddedness in young adults is linked to better physical health over the course of life.

According to Bian (2020, p. 427), "the more connected one remains to distant alters, the greater availability of context-specific information one keeps acquiring and the more resources one has in coping with Covid 19." As the number of FTF non-kin contacts decreases, it indicates a deficiency in this regard, which may be somewhat compensated by the remaining, strengthening, and intensifying FTF kin ties. With the contact diary approach—a direct and more extensive method to measure egocentric FTF networks—researchers can collect the actual contact data of the individual and study its dynamics amid such strange and atypical circumstances (Fu, 2005, 2007).

9. Limitations

Our chosen methodology can detect statistically significant differences between two independent samples only at the population level. We do not have panel data; therefore, we are not able to detect changes on the individual level. Moreover, we cannot exclude alternative explanations on the population level; we could only assume that all other factors remained the same between 2015 and 2020, except for the Covid-19 pandemic. Nevertheless, our results seem to support the theory that changes are due to the pandemic. For instance, the average household size probably increased because people moved together during the time of the lockdown (for instance,

young adults might have moved home because dormitories were closed). Furthermore, detected changes in the population's employment status are probably because many people lost their jobs (or were temporarily off from work) and also because of the virus and the lockdown. Another limitation of the study involves the mode of the data collection not being the same in the two years. Data collection was implemented by CAPI survey methodology in 2015 and by CATI survey methodology in 2020.

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Conflict of Interests

The authors declare no conflict of interest.

Supplementary Material

Supplementary material for this article is available online in the format provided by the author (unedited).

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