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Using digital technologies to minimize gender asymmetry in unpaid labour

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Abstract

This article analyzes the distribution of unpaid labor in Russian households based on 2024 data from the Federal State Statistics Service and a survey conducted by the authors. This article describes the age dynamics of the gender gap, compares the actual distribution of family responsibilities with the normative ideal, and assesses the prospects for using digital technologies in this area. It was found that the largest gender gap in time spent on unpaid labor is observed in the age group of respondents corresponding to the peak of parental workload. A discrepancy between the actual and ideal structure of the distribution of responsibilities was revealed, with high mental workload predominantly on one partner. The use of digital technologies to reduce gender asymmetry is generally perceived positively; however, predictive analytics and optimization of routine tasks are more actively supported than the role of AI as a mediator, assigner of responsibility, or family psychologist. The authors propose a conceptual digital model for reducing gender asymmetry in unpaid labor, encompassing the individual, corporate, state, and axiological levels.

Keywords

AI-assisted delegation, domestic labour, mental load, unpaid labour, work-life balance

Introduction

According to Rosstat (Federal State Statistics Service of the Russian Federation), the natural population decline in 2024 reached 596.2 thousand people, which was 20.4% higher than the figure for the previous year (Rosstat 2025b); at the same time, the total fertility rate in the Russian Federation fell to 1.374 in December 2025 – the lowest since 2006 (with 2.1 being the replacement-level fertility rate (Vedomosti 2026)). Tkachenko (2026) views depopulation and declining fertility as a systemic challenge that requires a reassessment of the state's demographic policy model itself. The number of divorces also has a negative effect on fertility: about 644 thousand divorces were recorded for 880 thousand marriages in 2024 (Rosstat 2025c). In the authors' view, behind the widespread explanation for divorce as the 'incompatibility of partners' characters' may lie, among other things, the consequences of everyday conflicts caused by the uneven distribution of domestic workload and the associated feeling of injustice. The growing sensitivity of households to the distribution of time, responsibilities, and resources makes it important to analyze the nature and volume of unpaid (domestic) labour in Russian families. Thus, the demographic and economic situation in the Russian Federation brings gendered distribution of unpaid labour within households to the forefront.

The amount of unpaid labour is comparable in scale to paid employment. Thus, according to expert estimates by the analytical project "If Be Precise" (based on Rosstat data), the value of Russian women's housework (estimated through the average wage) could amount to about 17% of GDP (Tochno 2025). At the same time, the International Labour Organization estimates the global total volume of unpaid labour at 16.4 billion hours per day (ILO 2018). An international ratio of time spent on unpaid labour of 3.2 to 1 in favour of women has been recorded, varying by region (4.0 in Asia, 1.8 in Europe). Over the period 1997–2012, women reduced the time spent on housework by 15 minutes per day, while men increased it by 8 minutes (ILO 2018). Conceptually, this persistence is explained by the theory of "doing gender," which describes the role of actions aimed at conforming to one's gender (West and Zimmerman 1987), and by the second-shift model (Hochschild and Machung 1989). The Russian specificity differs in an unfinished gender transition, expressed in the growth of gender equality in public institutions and the persistence of a traditional distribution within

households (Kalabikhina and Shaykenova 2019; Bugdaeva 2023). Another study identified a related phenomenon of divergence in assessments and in perceptions more generally. Men and women from the same households differ in their assessments of mutual contributions to housework and childrearing by an average of 5–7 percentage points (Makarentseva et al. 2017; WCIOM 2023). Shchurina (2023) supplements this picture by noting that social inequality in Russian society manifests not only through differences in income, but also through the structure of household spending and consumption. Thus, unpaid labour is significant, but it is not accounted for as a component of the household economy.

At the same time, a pronounced asymmetry in paid work among citizens of the Russian Federation still remains. The unadjusted gender gap in average accrued wages is 43.5% (Rosstat 2024). A meta-analysis by HSE recorded a weighted average wage gap of 37.3%, influenced by factors such as the "motherhood penalty" (a decline in pay after the birth of a child), occupational segregation, and women's willingness to take risks and compete (Roshchin and Yemelina 2022). At the same time, Russian women aged 20–49 demonstrate a high employment rate – 82.8% among those with children under 18 (Rosstat 2025a). Their share among the self-employed increased from 45% in 2020 to 48% in 2024 (WCONS 2024). However, their return from childcare leave is accompanied by lower wage offers and discrimination at the recruitment stage (Karabchuk et al. 2021).

The quantitative data substantiating the existence of asymmetry in paid and unpaid labour reflect the explicit, directly measurable part of family burdens. The key conceptual shift of the last decade has been the introduction of the notion of mental load associated with housework. Daminger (2019) identifies four stages of unpaid domestic labour: anticipating the workload, identifying options, making decisions, and monitoring implementation. It has also been recorded that the stages of anticipating and monitoring the workload are predominantly carried out by only one partner. At the same time, in a broader perspective, the concept is considered in which family activity represents a special type of labour with its own goals, means, and distributed responsibility among family members (Pryazhnikov et al. 2024). This creates an invisible managerial burden that occupies cognitive resources alongside paid employment. However, this component is not taken into account either in time-use diaries or in corporate personnel efficiency metrics. As a result, one of the potential factors sustaining gender asymmetry remains unexplored.

Measures to stimulate fertility in the Russian Federation are aimed primarily at material support for young or low-income families, whereas raising a child and managing everyday household life also require a significant amount of parental time. Traditionally in Russia, issues of health, extracurricular activities, and upbringing fall mainly on women, and the availability of kindergartens and polyclinics in most regions is far from sufficient. Contemporary budget policy in Russia is focused primarily on direct transfers to families (maternity capital, the unified child benefit). At the same time, for example, tax incentives for external household services and care infrastructure are not implemented. As part of the discussion, a fiscal instrument in the form of a childlessness tax is also proposed (Anureev 2025), which has triggered a negative public reaction. At the same time, a comparative analysis of global practices identifies four substantively different groups of policy measures: 1) regulation of work boundaries (the right to disconnect, France 2017), allowing people not to answer business calls or emails outside working hours; 2) tax incentives for external household services (RUT-avdrag in Sweden, CESU in France), for example, the possibility of receiving a tax deduction for paying for home cleaning or a nanny; 3) a non-transferable father's quota in parental leave (Sweden, Norway, Iceland, Germany, Spain) for greater involvement of fathers in childrearing from birth (ILO 2022; Tamm 2019). In the authors' view, such current financial support measures can be considered insufficient, since the structure and volume of family expenses has shifted substantially in recent years, which has increased households' sensitivity to the costs of childbirth and childrearing. As a precondition for the forthcoming changes in the Russian Federation connected with the use of global

experience (in the field of minimizing gender asymmetry in childcare and, more broadly, in domestic labour), one may point to V.V. Putin's address at the meeting of the Council for Strategic Development and National Projects (December 2025). The President of the Russian Federation outlined the need to support involved, responsible fatherhood as a new political contour in the country (Kremlin 2025). Bezrukova and Samoylova (2022) confirm that a shift from traditional to involved fatherhood is currently taking place and emphasize the need to develop programs of "social support for fathers" and, in fact, "father-specific" services. However, while the existing egalitarian attitudes of young people are not yet supported by systematic education (Evgenyeva and Selezneva 2025), digital mediation of routine practices is becoming an integral part of the environment of the new generation (Polevaya 2023) and, in the authors' view, requires integration into the most important spheres of citizens' lives.

At the corporate sector level, the response to the structural processes described above remains fragmented. Between 2014 and 2025, the share of Russians declaring work-life balance fell by 8 percentage points, while the share giving priority to work increased by 7 percentage points; in 2025, 44% of respondents reported having found balance (SuperJob 2025). The length of the working week in the Russian Federation is one of the longest in the world, despite the fact that according to Article 91 of the Labour Code its normal length does not exceed 40 hours per week. The number of employed women increased by 4.4% in 2010–2023, and the ratio of employed men and women in 2023 was 51% and 49%, respectively (Rosstat 2025a). At the same time, women are overrepresented in sectors where irregular working hours and overtime are common: health care, general and vocational education, trade, and services. As part of the social package, employers sometimes offer flexible schedules, remote and hybrid formats; less often – corporate childcare centers and one-time material assistance (ILO 2018). But it is important to note that, in the authors' view, in practice the opportunities related to working conditions are used by mothers mainly for childcare (when time is freed from work, the woman cares for the child, and vice versa), and by fathers for personal purposes, which may sustain the existing gender asymmetry in unpaid labour.

The possibilities of using digital technologies open up an additional channel for the above-mentioned issue. Kapranova (2025) shows that digital transformation has an overall positive effect on the level and quality of life of Russians, but it also generates new forms of inequality. Studies show that the use of information and communication technologies outside working hours can intensify work-family conflict by blurring boundaries, and conversely can balance the workload if employee autonomy is maintained (Santos et al. 2023). It is also argued that, for example, a digital workplace can have a positive effect on work-family balance and improve communication, but new strategies for maintaining balance are required (Lyz and Gladkaya 2026). Empirical studies estimate the potential automation of typical domestic tasks at approximately 39% over the course of this decade (Lehdonvirta et al. 2023). Existing digital products, however, simplify mainly the executive rather than the cognitive component of labour. For example, 86% of users of the digital family planner Cozi are married women with children. This shows that a tool intended to reduce the burden actually imposed an additional task of managing delegation on the already potentially overburdened partner (Heaven 2022). Thus, the importance of observing the principle of fairness by design increases – as a mandatory requirement for such programs, theoretically formulated but not widely implemented. Revenko and Revenko (2025) note that multilateral rules for the use of AI are still mainly in the form of recommendations and codes for software developers. In summary, the introduction of artificial intelligence-based tools into such sensitive areas of private life as family routines takes place under conditions of a fragmented regulatory regime. The research question of the present work is formulated at the intersection of the demographic challenge, the structural gender asymmetry in the distribution of unpaid labour, and the emerging regime of digital delegation and mediation.

The purpose of this study is to describe the age profile of the gender gap, compare the actual and normatively desired distribution of domestic responsibilities, and assess whether a digital AI assistant can serve as an auxiliary tool for reducing mental load and gender asymmetry (as an element of a system of state and corporate policy aimed at increasing the state's demographic indicators).

Materials and methods

As the empirical basis of this study, two complementary sources were used. First, data from the Selective observation of the daily time use by the population, conducted by the Federal State Statistics Service of the Russian Federation in 2024. The sample size of the survey was about 45 thousand households, corresponding approximately to 100–110 thousand individual respondents. The following data were used for the analysis: 1) 17 age groups from 10–11 to 80+ years separately for women and men; 2) the presence of co-residing children under 18, including a subgroup with children under 6 years of age; 3) employment status – employed, non-employed, non-employed pensioners. The aggregated indicator "domestic labour" included the following categories: housework in the narrow sense (cooking and cleaning), shopping and obtaining services for the household, care and upbringing of children under 18, and assistance to adult family members. Categories such as gardening and vegetable-garden work, livestock care, and home improvement work were separately identified as primarily related to employment in a private subsidiary household, and were considered only in robustness checks. The categorical scheme of domestic labour is aligned with the approach implemented in Bugdaeva (2023) based on the previous wave of the Selective observation of the daily time use by the population, which ensures substantive continuity of the analysis.

The second source is an original questionnaire survey conducted anonymously in online format in early 2026 ($N = 85$), aimed at capturing the subjective dimension of unpaid labour distribution and respondents' attitudes toward the use of digital AI assistants in domestic labour and family relationships. The socio-demographic structure of the sample is as follows: the respondents' age ranges from 17 to 67 years ($M = 34.8$; $SD = 12.8$; median 36); the distribution is bimodal with peaks in the 17–24 (31.8%) and 35–44 (34.1%) cohorts. The share of respondents with higher education is 67.1%; the level of paid employment of 20+ hours per week is 74.1%; 69.4% are in a registered marriage or stable partnership; and 44.7% have co-residing children. Statistical calculations were performed by the authors in IBM SPSS Statistics 27. During manuscript preparation, large language model tools were used for the visual design of figures based on numerical results and specifications provided entirely by the authors. The language models were not used to generate empirical data, conduct the survey, perform statistical calculations, or substantively interpret the results. Descriptive statistics, the paired Wilcoxon signed-rank test for comparing actual and desired shares, Spearman's rank correlation coefficient, the Mann-Whitney U test for comparing groups, simple linear regression, and assessment of internal consistency (Cronbach's alpha) were used.

The following hypotheses are tested.

Hypothesis 1. The gender gap in time spent on unpaid domestic labour in Russia has a distinct age profile and reaches its maximum in the active parenthood cohort, and its structure differs between weekdays and weekends.

Hypothesis 2. The discrepancy between the actual and desired distribution of domestic labour is uneven across task types. The level of cognitive (managerial) load concentrated on one of the partners is associated with self-reported loss of productivity in paid work.

Hypothesis 3. Respondents' attitudes toward the AI assistant for family workload are structurally heterogeneous. Differentiation of support is expected across operational functions (planning, delegation) and emotionally mediating functions (analysis of conflicts).

Hypothesis 4. Generations Y and Z demonstrate a more flexible normative profile (fairness as alignment with individual preferences rather than formal 50/50 parity) and at the same time greater openness to AI-mediated domestic tasks.

Results

Objective picture: the gender gap in the Selective observation of the daily time use by the population data (2024)

The age profile of respondents is presented by three regimes (Fig. 1). The adolescent and early-adult regime (10–19 years). Their domestic labour costs are low for both sexes (from 55 minutes for boys aged 10–11 to 2 hours 10 minutes for girls aged 18–19), and the female/male ratio varies from 1.3x to 1.7x. The active parenthood regime (20–39 years). In this group, time costs rise sharply, with the increase falling mainly on women. In the peak cohort of 30–34 years, women spend 5 hours 10 minutes per day on domestic labour, men 2 hours 11 minutes (ratio 2.4x, absolute gap 2 hours 58 minutes). The final group is the post-reproductive regime (40+ years). Their time costs remain high, but the ratio gradually declines to 2.1x in the 40–44 cohort, 2.0x in 55–59, and 1.8x in 65–69.

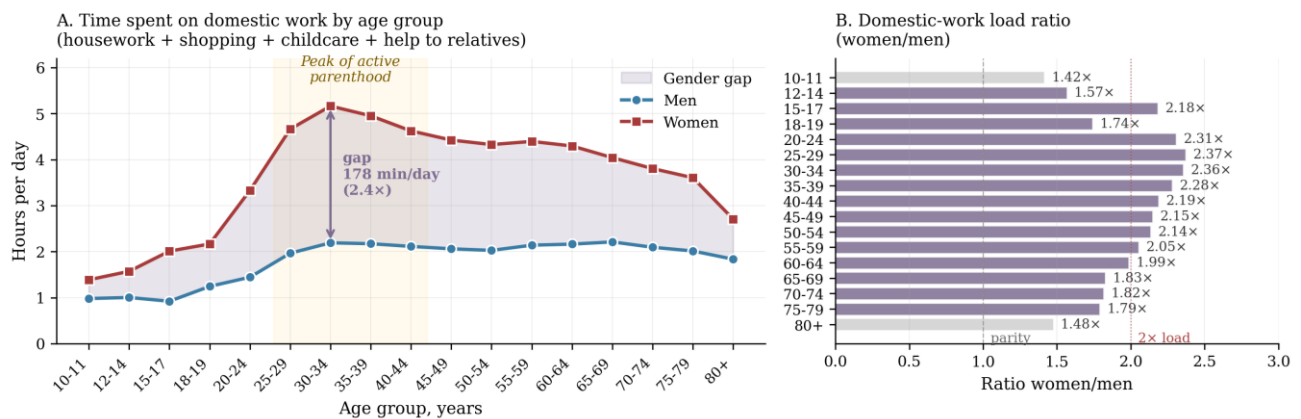


Figure 1. Gender gap in domestic work by age group, Russia 2024

Source: Constructed by the authors based on Rosstat’s 2024 Selective observation of the daily time use by the population data.

Effect of children. On a weekday, women with children under 6 years old spend 5 hours 30 minutes on domestic labour (versus 3 hours 22 minutes for women without children – an increase of 2 hours 8 minutes). For men in a similar family situation, the time spent is 1 hour 29 minutes (versus 1 hour 53 minutes for men without children – a decrease of 24 minutes). A direct comparison of time spent on childcare among respondents aged 30–34: 1 hour 16 minutes for women versus 28 minutes for men (ratio 2.7x).

Employment effect. For employed women, on a weekday, domestic labour amounts to 2 hours 24 minutes, which is substantially less than for non-employed women (5 hours 6 minutes), but twice as much as for employed men (1 hour 11 minutes). Whereas among non-employed women, the gap with non-employed men narrows to 1.6x on weekdays and persists on weekends (1.46x). For men with a child aged 0–6, paid work time on a weekday amounts to 5 hours 28 minutes, which is 1 hour 20 minutes more than for men without children. For women with children aged 0–6, paid employment amounts to 2 hours 53 minutes, which is 17 minutes less than for women without children. An employed woman spends 5 hours 0 minutes on domestic labour on a day off – 1 hour 35 minutes more than an employed man (3 hours 25 minutes) and comparable to a non-employed woman (4 hours 46 minutes).

Summary indicator. At the level of the Russian population as a whole, women aged 15+ spend an average of 4 hours per day on domestic labour (cooking, cleaning, shopping, childcare, and helping relatives), while men spend 2 hours 11 minutes (ratio 1.8x).

Subjective dimension and digital context: data from the authors' survey

Reality and the normative ideal of the distribution of domestic labour. In the two basic categories – routine domestic work (cooking and cleaning) and the administrative-management block (shopping, healthcare, documents, family finances) – the actual share of women systematically exceeds the desired one: 69.1% versus 53.9% for cooking/cleaning, and 63.5% versus 47.4% for administration. The differences are statistically significant at $p < 0.001$ according to the paired Wilcoxon test in the female subsample. In the childcare category, the gap is minimal on weekdays (Fig. 2). Analysis of self-assessments separately by respondents' sex reveals substantively different perception profiles. Women assess their share in cooking and cleaning at 70.2% on average, while men assess their share in the same category at 37.5%. In the category of shopping and administrative tasks, women indicate their share at 67.8%, men – 56.7%. For childcare on weekdays, women assess their share at 58.3%, men at 30.0%. This indicates that men and women describe the distribution of labour from substantially different positions of perception, especially in routine physical work and childcare.

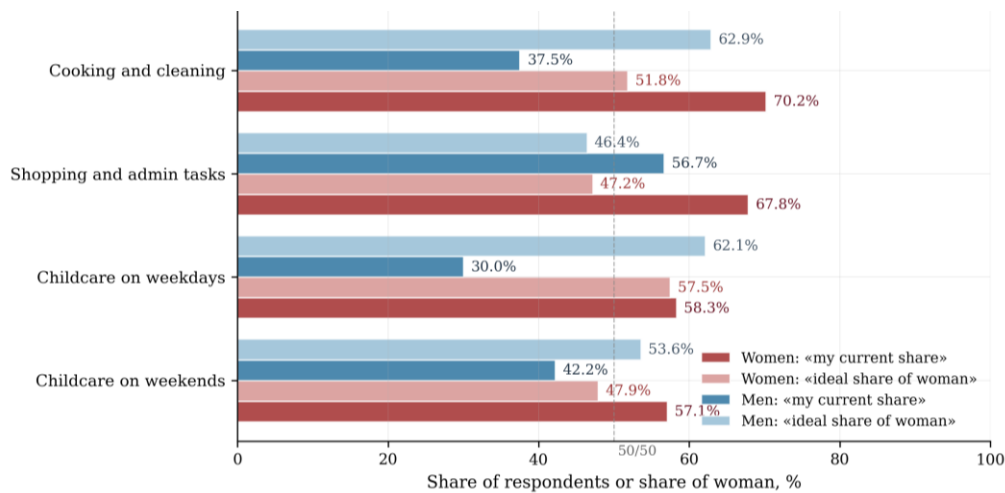


Figure 2. Self-reported actual share and ideal distribution by gender of respondent

Source: compiled by the authors based on the survey results.

Cognitive load. The analysis of mental load was conducted on the subsample of respondents in a couple or marriage. The distribution of mental load ratings shows a pronounced skew toward high values: 48% of respondents chose the pole option "almost always me," and another 16% – "more often than the partner"; the mean score for the sample was 4.03 (SD = 1.05). None of the respondents chose the opposite pole, "almost always the partner." Across subsamples, the value of mental load is higher among respondents with co-residing children ($M = 4.13$).

Correlations. The correlation pattern (Fig. 3) reveals three statistically stable clusters. Perceiving the distribution as fair is positively associated with satisfaction with the relationship ($\rho = +0.60$; $p < 0.001$). Mental load is inversely associated with perceived fairness ($\rho = -0.37$; $p < 0.01$) and positively associated with self-reported expected productivity gains from redistribution of responsibilities ($\rho = +0.43$; $p < 0.001$). The indicator of distraction at work because of thoughts about home is significantly associated with expected productivity gains ($\rho = +0.40$; $p < 0.01$). Readiness to use an AI tool is associated with the assessment of the usefulness of the predictive plan ($\rho = +0.64$; $p < 0.001$), and the expected productivity gain with approval of an AI assistant in this area ($\rho = +0.38$; $p < 0.01$).

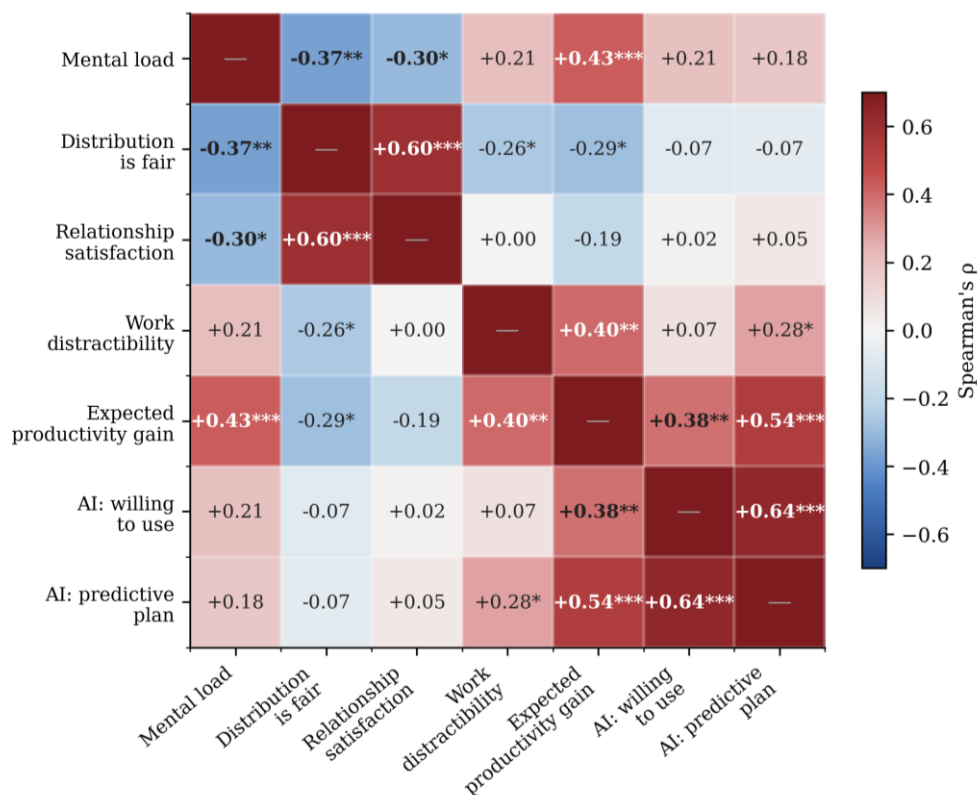


Figure 3. Correlation matrix of key indicators (Spearman's ρ)

Source: compiled by the authors based on the survey results.

Principle of fairness and generational profile. Only 3.5% of the sample chose strict formal parity 50/50 as the ideal. 71.8% of respondents were distributed between equality of effort and load (36.5%), distribution according to personal preferences and skills (35.3%), and distribution according to current workload in paid work (22.4%). The principle of "traditional gender roles" was supported by only 2.4% of respondents. In the 17–24 and 25–34 cohorts, the answer "according to personal preferences and skills" predominates (41% and 45%, respectively). In the 35–44 cohort, 48% of respondents chose "equality of effort and load." Among female respondents who chose "equality of effort and load," the actual share of women in cooking/cleaning was 65.7%, and in administrative tasks 67.1%.

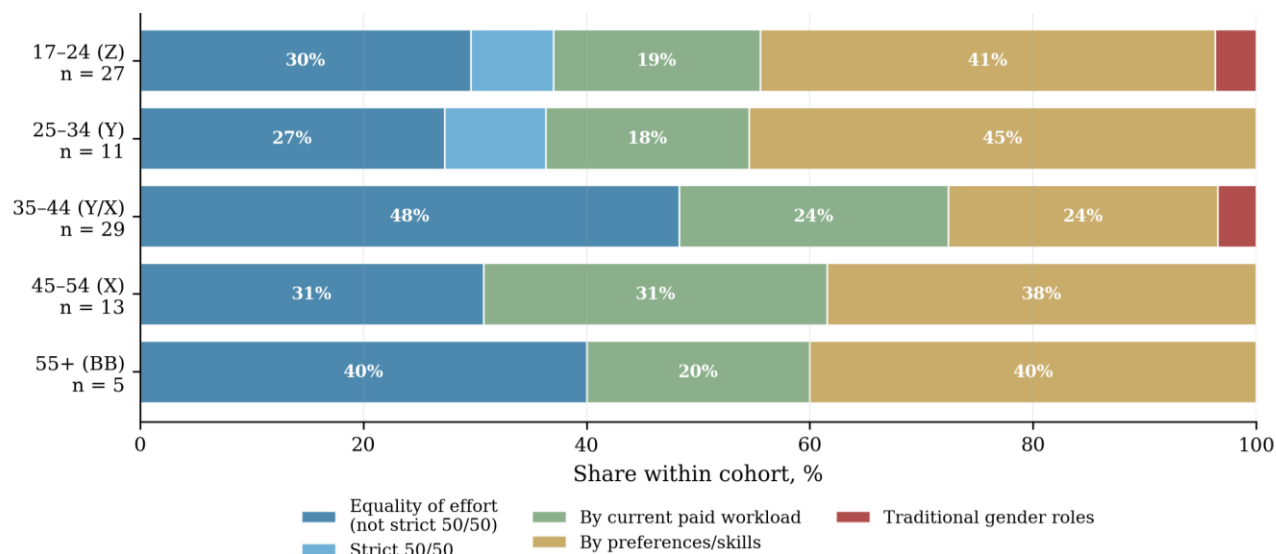


Figure 4. Preferred principle of fair distribution by birth cohort

Source: compiled by the authors based on the survey results.

Attitudes toward the AI assistant. The composite index of approval of the AI assistant (willingness to use the service, expectation of relief from workload, and useful key functions; Cronbach's alpha = 0.85) shows a statistically significant age gradient (Fig. 5; $\rho = -0.245$; $p = 0.024$; $N = 85$). Linear regression showed a decline in the index by 0.026 points for each additional year of age. Cohort analysis: peak support falls in the 25–34 cohort ($M = 3.89$), followed by 17–24 ($M = 3.17$), then 35–44 ($M = 2.72$), 45–54 ($M = 2.57$), and 55+ ($M = 2.20$). In the age group ≤ 30 years, 47% of respondents are ready to use the tool, while in the group over 30 years – 28% ($U = 1098.0$; $p = 0.021$).

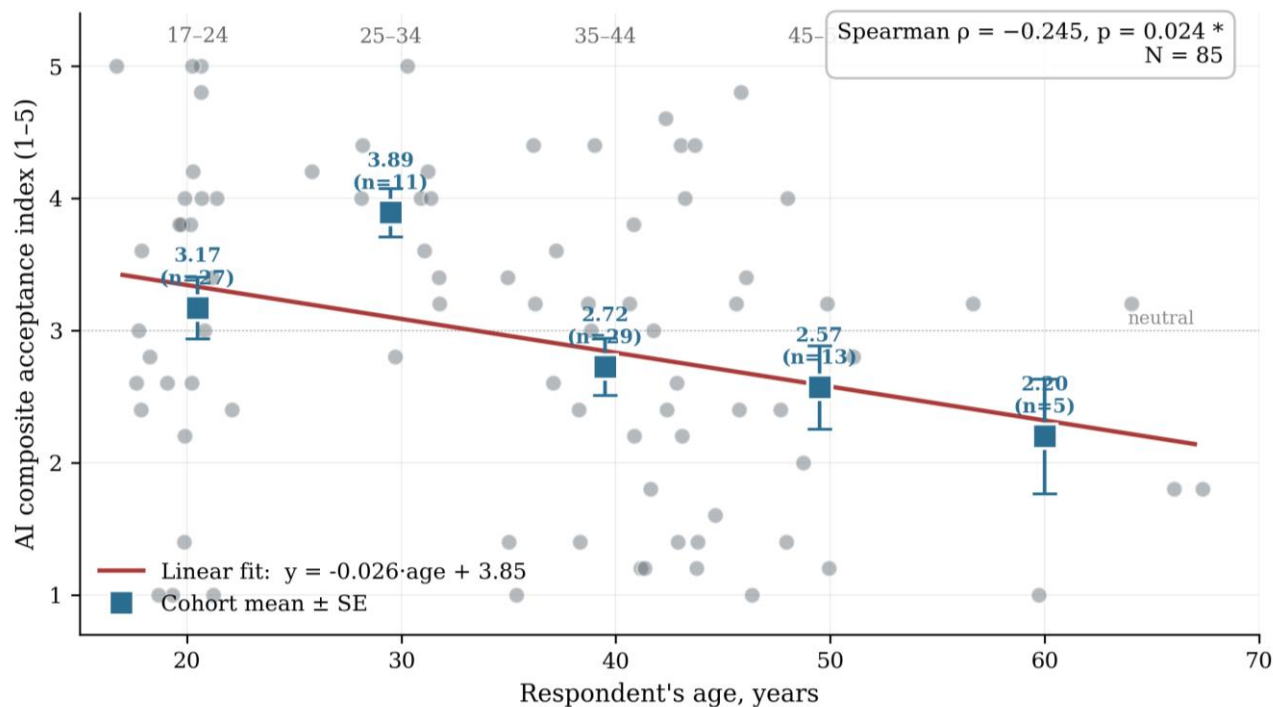


Figure 5. Age and acceptance of an AI domestic-load assistant

Source: compiled by the authors based on the survey results.

Usefulness of individual functions and concerns. The overall willingness to use an AI assistant is supported by 35% of the sample ($M = 2.95$). When broken down into specific functions, the perception changes: the function of assigning responsibility with reminders receives 48% support, predictive planning for the week – 40%, and visualization of workload balance was chosen by 35% of respondents. The AI-based conflict tracking function received the lowest support (29%, $M = 2.42$). Among those respondents for whom conflicts over domestic responsibilities arise regularly ($n = 43$), only one third (33%) consider the conflict-log useful, while half (51%) do not. The structure of concerns is as follows: "mechanization" of relationships – 61.2%, data privacy – 50.6%, concern that the partner will not accept the tool – 40%. Concerns about "mechanization" are stronger among respondents with rare/absent conflicts (71%) than among those with conflicts (54%). Only 11.8% of the sample have no concerns and are ready to try it (mean age of this subgroup – 29 years).

Discussion

The age profile of the gender gap (Fig. 1) demonstrates a key regularity previously described as an unfinished gender transition (Kalabikhina and Shaykenova 2019). The peak asymmetry occurs not among older cohorts with a traditional way of life, but precisely at the age of active parenthood, which allows it to be interpreted as a structurally family-related rather than generational phenomenon. In turn, the paradoxical decline in men's burden in families with small children may be associated with a compensatory increase in time spent on paid work. Thus, men with children aged 0–6 work 1 hour 20 minutes more than men without children, while women with children work 17 minutes less than women without children. These data confirm the presence of such phenomena as the "fatherhood bonus" and the "motherhood penalty." The structure of the gap differs between weekdays and weekends. On weekdays, the economic logic of time allocation plays the leading role. It was found that the volume of paid employment substantially reduces domestic load for both sexes. On weekends, by contrast, this logic recedes into the background, and the sociocultural mechanism, expressed in persistent gender norms, becomes more visible. Thus, the gender gap remains at a high level regardless of whether the woman works. The Russian model of labor distribution in the family here represents such a phenomenon as the second shift (Hochschild and Machung 1989). Hypothesis 1 was confirmed.

The correlation pattern (Fig. 3) is consistent with the mechanism of the work-home resources model (Ten Brummelhuis and Bakker 2012), according to which the demands and resources of one sphere affect outcomes in another indirectly through the subject's personal resources, such as time, energy, and cognitive load. Based on the survey results, mental load is statistically associated with perceptions of fairness and self-reported expected productivity gains. Mental load directed at unpaid domestic labour shows a relationship both with the feeling of injustice and with self-assessments of distraction from tasks in paid work. This is consistent with Hypothesis 2 and with the thesis of the third (mental) burden of the working woman, formed on top of the classic second shift (Hochschild and Machung 1989; Daminger 2019). The paradoxical observation identified when comparing normative attitudes and actual distribution is that, nominally, respondents adhere to the principle of equality, but this is not translated into actual domestic labour practice.

The generational breakdown of normative attitudes (Fig. 4) indicates that young people do not reject the idea of fairness, but formulate it in a more liberal, less rigidly egalitarian key. From this point of view, a fair distribution is one agreed by both partners, taking individual preferences into account, rather than being formally symmetrical in time or effort. The 25–34 cohort, showing the highest openness to the AI tool ($M = 3.89$, Fig. 5), is the same age zone in which the objective gender gap is formed and approaches its peak (ratio 2.4x in the 30–34 cohort). The digital loyalty of Y and Z generations, combined with a more flexible normative profile and a relatively high share of active use of digital assistants in other spheres of life, forms a structural precondition for the early introduction of an AI tool to support the balance of domestic load. The above confirms Hypothesis 4.

Hypothesis 3 was confirmed in its structural part. The predicted differentiation of approval by function type was confirmed. Operational functions (planning, delegation, visualization of balance) are supported much more strongly than functions that intrude into the emotional sphere (the conflict-log was chosen by 29% of respondents, the minimum in the sample). In terms of overall approval, the data showed a moderately restrained attitude, which in substantive terms indicates respondents' willingness to delegate managerial labour to AI assistants, but not the role of an "arbiter" or "psychological mediator."

The analysis of respondents' concerns clarifies the reasons for selective willingness to use the AI tool. The most common concern is mechanization. Respondents believe that using the AI tool will turn relationships into formal control and displace live communication. Of particular note is that among respondents who have regular conflicts over domestic responsibilities, only one third consider the AI-based conflict tracking function useful. Respondents declare the presence of conflicts as a real problem, but refuse the technological tool for resolving it. This picture may indicate that the refusal of instrumental intervention (AI) is not functional but normative-emotional in nature. Respondents perceive the sphere of domestic negotiations as a space of non-digitized, personal, confidential interaction and are not ready to consider conflict as an incident in the sense of an IT service.

Digital system for reducing gender asymmetry in unpaid labour

This section is conceptual and design-oriented, since the architectural solutions presented below are formulated on the basis of identified patterns and require verification in further empirical studies. The results obtained as a whole make it possible to formulate requirements for the design of a solution architecture that is fundamentally different from existing applications – digital planners and digital services. An architecture of a system that requires the user to enter data on task distribution in order to manage them may impose additional managerial load on an already overburdened partner. A possible solution is a system built around the principle of fairness by design, implemented through selective activation of modules rather than through a fully centralized management system, and integrated with large data at the state and corporate levels.

The authors propose to consider the reduction of gender asymmetry in unpaid labour as a four-level integrated architecture whose elements are connected by a common digital infrastructure.

Level of the hyper-personalized AI assistant for family workload. The fundamental difference from existing planner applications is that the managerial contour passes to AI through indirect signals. For example, a shared calendar, purchase history, geolocation, digital trace (with the explicit consent of both partners and with local processing of sensitive categories). Potentially freeing users from independently entering information, AI takes on exactly the work that has so far remained invisible and was held by one of the partners "in mind," not doubling it but transferring it into digital space. The possible functionality of the system is as follows: 1) predictive planning of weekly workload based on the combined employment of both partners; 2) visualization of time balance based on four family parameters: time spent on paid work, presence and age of children, self-assessed mental load, and agreed individual preferences, calculating approximate optimal hours for users' domestic labour; 3) assignment of responsibility with reminders, linked to individual preferences, competencies, and current paid-work workload; a module for early recognition of escalating communication patterns, only for those users who explicitly choose this functionality, and without storing the content of sensitive information on servers.

Level of the corporate contour. The main direction here is measuring the employee's total burden as an HR metric, including its domestic component (for example, through assessment methods such as "720 degrees" or by reflecting the volume of burden in corporate planners). A practice could be introduced of normalizing fathers' leave while preserving full pay and issuing fathers a sick leave

certificate. Corporate services for external replacement of domestic labour could also be developed (employer childcare centers, food/grocery delivery, cleaning at a corporate rate).

Level of state infrastructure. At this level, the most significant measures are a non-transferable father's quota in parental leave following Scandinavian models, tax incentives for external household services following Sweden's RUT-avdrag and France's CESU, and systematic time-use monitoring linked to the assessment of the effectiveness of state measures.

Normative and educational level. Counseling programs for men on family, fatherhood, and the distribution of domestic responsibilities, structured not as an ideological campaign but as educational support for the three previous levels.

The fundamental link between the levels is provided by a common digital infrastructure. Data from state time-use surveys can provide an objective factual basis for calibrating corporate and personal digital tools. In anonymized form, the AI assistant can transfer aggregated family workload patterns into the state monitoring system. Corporate diagnostics of workers and state databases create a unified field of metrics in which changes in workload in the domestic sphere become a measurable indicator of economic effect. As a point of initial diffusion of such a system, the authors identify the cohort of young working parents (25–34 years), in which, according to the data obtained, structural need, normative flexibility, and technological openness simultaneously reach a local peak. At the same time, it is important to note that the implementation of such solutions requires separate consideration of ethical issues, data privacy, the regulatory and legal aspects of user consent, and the risks of excessive digitalization of family private life.

Limitations

The objective indicators are based on aggregated Selective observation of the daily time use by the population tables, which does not prevent analysis by age, presence of children, and employment, but does not allow regression models at the individual level. The authors' survey is not intended to be representative of the entire population of Russia and is used as an exploratory tool to capture the subjective-digital dimension complementing the objective Selective observation of the daily time use by the population (2024) data.

Conclusion

The results obtained made it possible to consider gender asymmetry in unpaid labour as a structural mechanism influencing paid labour – in terms of work efficiency, career development, and wages. The objective and subjective findings consistently indicate to the difficulty of identifying the cognitive-managerial component of unpaid labour. The identified gap between normative declarations and actual practice in Russian families proved to be indicative. The time-use data based on Selective observation of the daily time use by the population 2024 substantively develop the results of Bugdaeva (2023), obtained from the previous Selective observation of the daily time use by the population 2019 wave, and confirm the stability of the identified patterns. According to the survey data, the observed gap may persist not because of a rejection of the idea of equality, but because of the absence of an operational tool for its daily implementation.

Hypotheses 1, 2, and 4 were confirmed in the data. Hypothesis 3 was supported partially, since the age gradient of approval of the AI assistant was confirmed, but the expectation of a purely positive assessment was not realized. Most respondents are ready to delegate only operational functions to AI (planning, delegation, visualization of workload), while the role of an arbiter or emotional mediator is rejected by them. This shifts the practical focus from the idea of a universal “neutral mediator” to the design of personalized, non-emotionally intrusive tools. For Russian households, the most promising direction is a flexible, layered design of a technological solution for reducing burden in the

sphere of unpaid labour. For practical implementation of the described approach, the development of an integrated system is proposed in which all four levels (individual, corporate, state, axiological) work in coordination, relying on a common digital infrastructure and the principle of fairness by design.

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