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STUDY PROFILE

Developmental Perspectives on Transitions at Age 60: Individuals Navigating Across the Lifespan (TRAILS) – latest data collection in a longitudinal JYLS study

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At around age 60, people are approaching late adulthood and are typically going through or anticipating life transitions such as grandparenthood, retirement, or changes in health and functioning. The timing and perception of transitions are individual and based on current circumstances and earlier life history and may link to well-being. The TRAILS (Developmental Psychological Perspectives on Transitions at Age 60: Individuals Navigating Across the Lifespan) study, which is presented in the current article, examines the diversity and underlying factors of different transitions at around age 60 and how they associate with mental well-being. It also investigates whether these transitions link to personality characteristics, contextual resources, and/or societal challenges. The role of earlier life history in the studied associations requires a prospective multiwave design where the same participants are followed over time. Only a few longitudinal studies have examined the developmental pathways from childhood to the beginning of late adulthood.

The TRAILS study continues the Jyväskylä Longitudinal Study of Personality and Social Development (JYLS). The JYLS was initiated in 1968 and includes earlier data collected from ages 8 to 50. At age 61, in 2020–21, 206 of the JYLS participants (of the initial 369 children) took part in TRAILS. The data collection included a Life Situation Questionnaire, a psychological interview, self-report inventories, a health examination and physical activity surveillance covering major areas of adult life. TRAILS extends the JYLS study to over 52 years of follow-up time and provides unique opportunities for studying individual development throughout the lifespan.

Keywords late adulthood • lifespan • longitudinal study • well-being • personality

Key messages

- Around age 60, people approach late adulthood and typically go through or anticipate transitions.
- The timing of transitions is based on current circumstances and earlier life history and link to well-being.
- Few longitudinal studies have examined development from childhood to late adulthood.
- The JYLS is over 52 years' follow-up and provides unique opportunities for studying development.

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Introduction

Traditionally, around age 60 has been considered to mark the end of a developmental period referred to as ‘middle adulthood’ and the beginning of ‘late adulthood’ (Lachman et al, 2015). This is a time when most people begin to anticipate or have already experienced life transitions concerning grandparenthood and changes in work and leisure time, combined with changes in one’s own, a spouse’s or ageing

parents' health and functioning. These transitions may require that more resources are directed towards the maintenance of functioning and the regulation of the losses (Baltes, 1997), but they also may lead to successful transition into role patterns that enable individuals to enjoy new roles and experience high levels of mental well-being (Wang and Shi, 2014; Infurna et al, 2020). Further, because people currently live healthier for longer than in previous decades, life around age 60 may actually be characterised by fewer or even unparalleled role transitions and, consequently, indicate no major changes in life situation and mental well-being. In any case, the transition or the anticipation thereof may urge the individuals to reflect upon their current situation and to prepare for the future (Kornadt et al, 2015; 2018) to maximise their well-being thereafter (Noone et al, 2009).

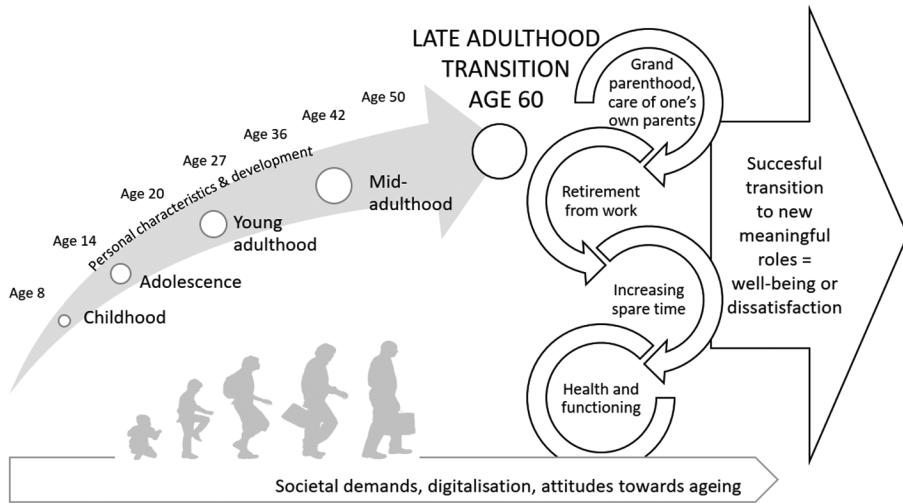
In the TRAILS (Developmental Psychological Perspectives on Transitions at Age 60: Individuals Navigating Across the Lifespan¹) study, which is presented in the current article, we examine whether the transition into new roles of late adulthood or their anticipation occurs at around age 60 and whether they bring satisfaction or compromise well-being (Figure 1). Mental well-being, including both positive and negative dimensions (Keyes, 2005; Kokko et al, 2013), when approaching late adulthood is assumed to contribute to well-being in later years. We expect much variation in the timing and manner in which individuals navigate through these role transitions. These may be due to individual characteristics such as personality (traits, attitudes and coping mechanisms, for example), availability of support within the individual's environment (such as relationships and financial resources), or due to the individual's adjustment to societal challenges (including digitalisation and attitudes towards population ageing). The development of individual differences is a lifelong process rooted in childhood experiences (Moffitt et al, 2017). However, few longitudinal studies are available that actually test this assumption by using information from childhood to the threshold of late adulthood.

TRAILS extends the Jyväskylä Longitudinal Study of Personality and Social Development (JYLS), which was initiated in 1968 with 8-year-old participants, to a new data wave in 2020–21 among its currently 60–61-year-old participants (hereafter 61). Thus far, JYLS includes follow-ups ranging from age 8 to age 50. Only a few lines of research on the developmental pathways from age 8 to 50 and in mid-adulthood development are highlighted here. *First*, personality demonstrates considerable stability during young and middle adulthood (Kokko et al, 2015) and significant but weaker stability from childhood into mid-adulthood (Pulkkinen et al, 2012). Individuals' identity status develops towards an achieved status from age 27 to 50 (Fadjukoff et al, 2016). *Second*, personality contributes to functioning in many areas of life. From childhood to adulthood, the links are indirect (Kokko and Pulkkinen, 2000). In mid-adulthood, personality traits as such associate with parenting (Rantanen et al, 2015), self-assessed health (Kinnunen et al, 2012), occupational well-being (Mäkikangas et al, 2015), and leisure-time physical activity (Karvonen et al, 2020). *Third*, at ages 36 to 50, adults have a high level of mental well-being – composed of emotional, psychological and social well-being, and marked by the absence of depressive symptoms (Kokko et al, 2013; 2015).

Continuing JYLS, TRAILS examines the beginning of a new developmental phase and its transitions with respect to work, leisure time, family and health.

The present main aim of TRAILS is to study during the transition to late adulthood:

Figure 1: The study will focus on individuals transitioning into late adulthood from a longitudinal perspective



1. how the experience of mental well-being evolves;
2. how personality characteristics evolve from childhood;
3. how current societal transformations, such as digitalisation and attitudes towards population ageing, evolve and relate to mental well-being;
4. how retirement or its anticipation, grandparenthood, leisure-time activities, and an increased concern over health link to mental well-being;
5. how future orientation links with experienced or anticipated life transitions and whether personality characteristics underlie these associations.

With previously collected JYLS data, TRAILS allows for the study of a broader range of research questions. The purpose of the current article is to describe the TRAILS data collection and methods, as well as the representativeness of the study participants in relation to their respective Finnish age-cohort (born in 1959) and to those participants of earlier JYLS data collections who did not participate in TRAILS.

Methods

Study design and sample

TRAILS continues JYLS, a longitudinal study that was initiated in 1968 and led until 2012 by Lea Pulkkinen. Katja Kokko has led JYLS since 2013 and is the principal investigator of TRAILS. Initially 369 participants (173 girls and 196 boys, all native Finns of whom 94% were born in 1959, 4% in 1958, and 3% in 1960) from 12 randomly selected second grade school classes located in Central Finland took part in the study (Pulkkinen, 2017). All children in these classes participated and, therefore, there was no initial attrition. Since then, the major data collections of JYLS have taken place at ages 8 (in 1968), 14 (1974), 27 (1986), 33 (1992), 36 (1995), 42

(2001) and 50 (2009). Between these major waves, some subsample data collections have been conducted. The participation rate in JYLS has remained high throughout the decades, being 85% for women and 83% for men, calculated from the eligible sample, in the previous data collection in 2009. Throughout the years, those who have participated in the study have been representative of the initial random sample and the respective Finnish age-cohort (Pulkkinen, 2017).

For TRAILS, we recruited all eligible participants of the JYLS at the beginning of 2020 (Figure 2). By then, 28 participants had died (8 women and 20 men) and 37 had withdrawn their consent for participation (22 women and 15 men), making the possible sample size 304 participants (143 women and 161 men). The postal information of the possible participants was updated from the Finnish Population Information System, leaving two men and one woman without contact information. Therefore, the eligible study sample was 301 participants (142 women and 159 men). About two thirds of these participants lived in Central Finland and the rest in other parts of Finland and abroad.

Ethics

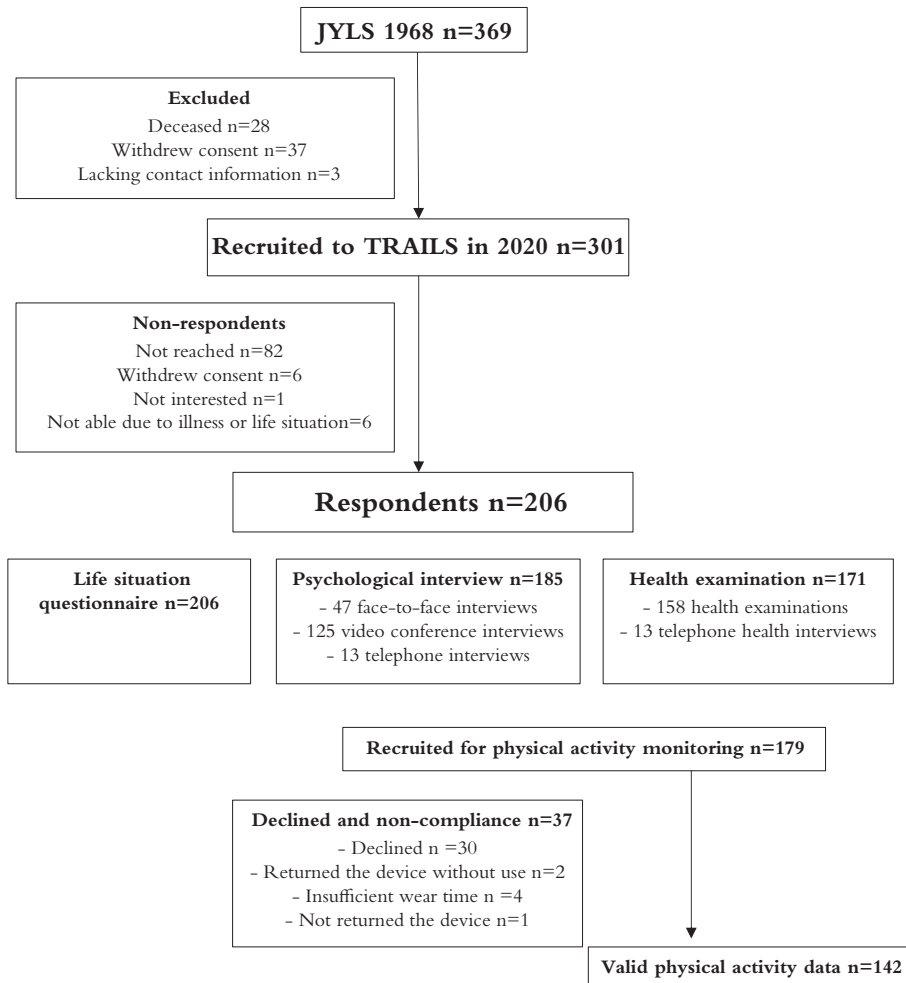
The TRAILS data collection was approved on 13 December 2019 by the Ethical Committee of the University of Jyväskylä (JYU), Finland. All data was collected and stored in accordance with the General Data Protection Regulation (GDPR). The participants gave their written informed consent for participation and for storing the data collected about them. They could freely decide in which parts of the study they would participate.

Recruitment process and inclusion criteria

On 11 February 2020, the eligible participants were sent a letter in which they were informed of the new data collection. The letter included a Life Situation Questionnaire (LSQ) and a written informed consent form, which they were asked to fill in and return via mail. After that, we contacted the participants by phone, and, depending on the participants' consent, scheduled the psychological interview and/or health examination. A repeat invitation letter was sent to those who had not responded in April 2020 ($n = 130$) and a second repeat letter in October 2020 ($n = 85$). There were no exclusion criteria for participation, and all willing participants were included in the study.

The influence of the COVID-19 pandemic on the data collection and study aims

On 16 March 2020, the government of Finland (Finnish Government, 2020) declared the state of emergency due to the outbreak of the COVID-19 pandemic. Because of this, the health examinations were discontinued, and the psychological interviews were continued via video conference program (Zoom Cloud Meetings, CSC/Funet; implemented through NORDUnet in compliance with Finnish law and European data protection regulations) or telephone from 6 April 2020 forward. Fourteen participants had been investigated by the time that data collection was discontinued. Additional questions related to the COVID-19 situation were added to the data collection protocol. The health examinations were continued on 1 June

Figure 2: Study flow of TRAILS

2020, and the psychological interviews were conducted both live and via video conference program from July 2020 onwards, depending on the participants' request of the mode of the interview. The last interview was conducted 1 July 2021 and the last health examination 19 April 2021.

Study flow

Of the 301 participants to whom the invitation letter was sent, 206 (107 women, 99 men) answered by filling in the informed consent form and the LSQ (Figure 2). The participation rates were, for women and men, 75% and 62% of the eligible sample and 62% and 51% of the initial sample. Additionally, seven people advised that they could not participate in the study, and six withdrew their consent of the JYLS study altogether. Of the 206 respondents, 185 (97 women, 88 men) participated in the psychological interview. A total of 171 (89 women, 82 men) participated in the health examination. Moreover, 142 (78 women, 64 men) participants provided valid physical activity data.

Representativeness of the study participants

The TRAILS participants were compared to the Finnish population born in 1959 (total N = 71,547; data received from the Finnish Population Information System in September 2021) using the newest information that was available for each variable (from years 2018–20) (Table 1) and to the participants of JYLS who did not participate in TRAILS (Tables 2 and 3). In line with the fact that more men (10% of the initial sample) than women (5%) had died, women were overrepresented in TRAILS in comparison to non-participants of the initial study sample of JYLS (52% at TRAILS versus 41% at the initial JYLS sample, $p = .029$) and, therefore, the analyses were conducted separately for women and men. There was no difference in the mortality rate between the TRAILS participants and the respective Finnish age-cohort. In comparison to the population cohort, the TRAILS women were more likely to have a vocational college education (bachelor's level) and less often a vocational school education (lower secondary level) (Table 1). The TRAILS men were more likely to be married and have children than the population cohort men. The employment situation of the TRAILS participants was representative of the respective population cohort. We acknowledge that some of the statistically non-significant differences between the TRAILS participants and the Finnish age-cohort group might be due to a lack of statistical power (Table 1). However, it is worth noting that the frequencies shown in Table 1 are quite similar for variables with non-significant p -values. It is challenging to perceive them as meaningfully different, but additional evidence would be necessary to confirm that the difference is not solely attributable to sampling variation.

At age 8, the TRAILS women had better school success than non-participant women, and the TRAILS men had lower behavioural activity than non-participant men (Table 2). Behavioural activity was assessed using a composite score derived from three teacher-rated items on whether the child is actively involved and plays eagerly with others or whether the child exhibits silent, withdrawn and timid behaviour (the latter are reverse scored). There were no differences between the TRAILS participants and non-participants in relation to the parental occupational status, and childhood well-controlled behaviour or negative emotionality. The results remained similar when the deceased participants were excluded from the analyses (Table A1, in the Appendix).

When comparing educational level at age 50, both the TRAILS women and men more often had vocational college education in comparison to the non-participants (Table 3). Moreover, the TRAILS women less often had a low level of vocational education than the non-participant women. The differences remained similar when the deceased participants were excluded (Table A2, in the Appendix). Both the TRAILS women and men less often had blue-collar occupational status at age 50 than the non-participants (Table 3). Further, the TRAILS men more often had upper white-collar occupational status than the non-participant men. The differences in occupational status were attenuated and no longer statistically significant when the deceased participants were excluded (Table A2). Smoking at age 27 was less common among the TRAILS men than the non-participant men (Table 3), and the difference remained when the deceased participants were excluded from the analyses (Table A2). Both the TRAILS women and men had lower alcohol consumption (grams per year) at age 27 and less signs of alcohol dependence (CAGE questionnaire) at age 36 than the non-participants in earlier adulthood. Only the difference in CAGE score

Table 1: Representativeness of the TRAILS study participants in relation to the Finnish population cohort born in 1959 (statistically significant p-values in bold)

	Population women (N = 34,472–36,339)	TRAILS women (n = 107)	p-value	Population men (N = 33,570–35,208)	TRAILS men (n = 99)	p-value
	%	%		%	%	
Deceased	4.6	4.6	.990	9.1	10.2	.595
Level of vocational education			<.001			.361
Vocational courses or less	12	10		19	24	
Vocational school ^a	44	24*		49	43	
Vocational college or polytechnic ^b	31	48*		21	18	
University	13	18		11	14	
Employment situation			.796			.337
Employed	67.9	70.1		61.3	68.7	
Unemployed	10.4	10.3		13.1	11.1	
Retired	18.1	17.8		22.0	19.2	
Other	3.7	1.9		3.6	1.0	
Marital status			.928			.046
Married/ in a registered relationship	55.0	53.3		56.2	67.7*	
Divorced	23.1	25.2		19.3	19.2	
Widowed	4.9	5.6		1.4	0.0	
Single	17.0	15.9		23.1	13.1*	
Number of biological children			.409			.020
No biological children	16	13		24	13*	
One child	16	16		15	12	
Two children	37	45		33	42*	
Three or more children	31	26		29	32	

(Continued)

Table 1: Continued

	Population women (N = 34,472–36,339)	TRAILS women (n = 107)	<i>p</i> -value	Population men (N = 33,570–35,208)	TRAILS men (n = 99)	<i>p</i> -value
	%	%		%	%	
Number of biological grandchildren			.372			.017
No biological grandchildren	46	50		59	55	
One grandchild	12	10		10	15	
Two grandchildren	15	19		12	19 ^a	
Three or more grandchildren	28	22		19	11	

Notes:

Data received from the Finnish Population Information System in September 2021; the newest information that was available for each variable (from years 2018–20).

*Adjusted standardised residual > [1.96] in comparison to the population.

^aLower secondary level.

^bBachelor's level.

among women remained significant in the analyses when the deceased participants were excluded. There were no statistically significant differences in self-rated health.

In addition, we compared the TRAILS participants who participated in all the major parts of the study (LSQ, psychological interview and health examination) to those who participated in only in some part(s) of the study: those who participated in all the major parts of the study were less likely to be daily smokers than those who participated in only some part(s) of the study (9% versus 30%, $p = .007$).

Data collection

Life Situation Questionnaire and personality inventories

The mailed LSQ (Pulkkinen, 2006; 2017) included questions and measurements related to work, living conditions, family and other relationships, leisure activities, information technology, health and health behaviours, and personal opinions (see later and Table 4 for further details). The questionnaires related to personality and values were also employed as mailed questionnaires.

Table 2: Representativeness of the TRAILS study participants in relation to non-participants from the initial study sample of the JYLS at age 8 (statistically significant p-values in bold)

	Women			Men		
	Non-participants (n = 66)	Participants (n = 107)		Non-participants (n = 97)	Participants (n = 99)	
	% (n)	% (n)	p-value	% (n)	% (n)	p-value
Occupational status of parent			.209			.924
Blue-collar	78.8 (52)	70.1 (75)		69.1 (67)	69.7 (69)	
Lower or upper white-collar	21.2 (14)	29.9 (32)		30.9 (30)	30.3 (30)	
	M (SD)	M (SD)		M (SD)	M (SD)	
School success	2.65 (1.07)	3.20 (1.00)	.001	3.04 (1.01)	3.00 (1.04)	.779
Behavioural activity	1.96 (0.72)	2.10 (0.76)	.249	2.22 (0.57)	2.03 (0.74)	.045
Well-controlled behaviour	1.48 (0.62)	1.58 (0.69)	.361	1.20 (0.76)	1.34 (0.73)	.193
Negative emotionality	0.48 (0.35)	0.40 (0.37)	.189	0.76 (0.53)	0.64 (0.47)	.104

Psychological interview

The psychological interview was semi-structured with both open-ended and closed questions, and additional questionnaires filled in by the participants. Interviews lasted approximately two to three hours (mean 2 hours and 44 minutes). Parts of the interview were recorded. A separate informed consent was requested from the participants for recording. The research themes covered in the psychological interviews included mental well-being, identity, leisure, family and other relationships, work, perceptions of ageing, life events, and future orientation.

Health examination

Health examinations were conducted by trained nurses and included a fasting blood sample, health interview, cognitive tests, and measurements of height, weight, waist and hip circumference, body composition, pulse, blood pressure and handgrip strength. The blood samples were taken either at the laboratory or in the participants' hometowns. The health examinations lasted approximately one to one and a half hours. For participants (n = 13) who were not able or willing to come to the health examination, health interviews were conducted over the phone.

Physical activity monitoring

The willingness to participate in physical activity assessment was asked in the health examination or by phone from those participants who were unable to participate

Table 3: Representativeness of the TRAILS study participants in relation to non-participants from the initial JYLS sample in adulthood (statistically significant p-values in bold)

	Non-participants women (n = 37–58)	Participants women (n = 100–107)	p-value	Non-participants men (n = 57–88)	Participants men (n = 93–99)	p-value
	% (n)	% (n)		% (n)	% (n)	
Level of vocational education at 50			.012			.015
Vocational courses or less	25.9 (15)*	10.3 (11)*		30.4 (28)	24.2 (24)	
Vocational school ^a	32.8 (19)	24.3 (26)		54.3 (50)	44.4 (44)	
Vocational college or polytechnic ^b	27.6 (16)*	47.7 (51)*		4.3 (4)*	19.2 (19)*	
University	13.8 (8)	17.8 (19)		10.9 (10)	12.1 (12)	
Occupational status at 50			.030			.032
Blue-collar	22.9 (11)*	8.4 (9)*		63.3 (50)*	47.5 (47)*	
Lower white-collar	60.4 (29)	64.5 (69)		20.3 (16)	19.2 (19)	
Upper white-collar	16.7 (8)	27.1 (29)		16.5 (13)*	33.3 (33)*	
Self-rated health at 36			.152			.137
Good	29.7 (11)	43.0 (43)		36.8 (21)	52.8 (47)	
Fairly good	48.6 (18)	31.0 (31)		31.6 (18)	27.0 (24)	
Average or poor	21.6 (8)	26.0 (26)		31.6 (18)	20.2 (18)	
Smoking at 27			.076			.026
Never	28.3 (15)	46.1 (47)		31.1 (14)*	33.3 (31)*	
Quitted	20.8 (11)	21.6 (22)		14.1 (11)	16.1 (15)	
Occasionally	11.3 (6)	10.8 (11)		10.3 (8)	15.1 (14)	
Daily	39.6 (21)	21.6 (22)		57.7 (45)*	35.5 (33)*	
Alcohol consumption	M (SD)	M (SD)		M (SD)	M (SD)	
Grams per year (at 27)	1,371 (1,651)	814 (1,034)	.030	3,758 (3,798)	2,421 (2,617)	.010
CAGE mean score (at 36)	1.61 (1.85)	0.71 (1.09)	<.001	2.57 (2.24)	1.67 (1.72)	.012

Notes:

*Adjusted residual > ±1.96 in comparison between non-participants and participants.

^aLower secondary level.^bBachelor's level.

in the health examination due to the COVID-19 outbreak. Accelerometers with instructions were either given out in the health examination or sent by mail.

Measures

All parts of the data collection were conducted in Finnish, meaning that in the case of validated international measures, Finnish versions of them were used. Measures that had not been yet translated to Finnish were translated using a forward-and-back translation procedure. Table 4 lists the main measures of TRAILS and the context of their assessment (LSQ, psychological interview, mailed inventory, health examination). The main reference (if available) and whether the measure is also available at earlier

ages is indicated. Selection of the measures was largely based on the earlier data collection phases of JYLS to ensure comparability between different ages. In addition, measures that were considered as central to examining the developmental phase of people in their 60s and to the current societal context were added.

As shown in Table 4, *mental well-being* included measures for emotional, psychological and social well-being as well as for depressive feelings and meaning in life. *Personality characteristics and personal opinions* were measured by socio-emotional behaviour, aggression, emotional expressiveness, vulnerability factors, personality traits, personal values and opinions, self-esteem, regrets and identity status. *Personal development and goal engagement* were assessed by generativity and integrity, personal control, and life goals. *Perceptions of ageing* were measured by subjective age, attitudes towards ageing, and perceived age discrimination. Further, *perceptions of future* included measures for preparation for ageing and future time orientation.

Information about *family structure and demographics, relations to one's children, grandchildren and own parents*, as well as *other social relations* were inquired about (Table 4). Further, the quality of the current marital/intimate relationship and relationship happiness and the quality of other social relations were assessed. Where relevant, those participants who were interviewed after the beginning of the COVID-19 pandemic were invited to consider their social contacts before the pandemic. As also shown in Table 4, information about *work and retirement* was collected. This included the current work situation, characteristics of work (for example, income, uncertainty, skill discretion, control, significance), occupational well-being (engagement, workaholism, time demands, exhaustion, recovery, interaction between work and family), career success, and retirement situation and experiences or thoughts. Additionally, the participants also reported whether they had participated in any education in the last ten years.

Life events and leisure activities were assessed using a calendar method and a questionnaire, respectively (Table 4). Further information was collected about *the use of modern technology and physical activity*. Physical activity was measured using both self-report measures of quantity, frequency, and mode and accelerometer-based measures. While experiencing the COVID-19 pandemic, participants were primarily asked to reflect on their leisure time in general. Additionally, they were presented with specific questions regarding physical activity during this period.

The assessment of *health and health behaviours*, as depicted in Table 4, involved self-reports on health, stress, symptoms, and alcohol and tobacco use. In addition, assessments were conducted during the health examination, which encompassed measures of institutional care, diseases, medication, hearing, menopause, blood pressure, body mass index and body composition, and sleep. Finally, measures of *functioning* included handgrip strength, overall physical functioning, mobility, functional ability, injuries, and various cognitive tests.

Data management and access

The TRAILS data, as well as previous JYLS data, are fully owned by the JYU and managed by the principal investigator. Data files are stored on the JYU secured server and protected by passwords. The metadata for earlier JYLS data (Appendix) are documented according to the standards used by the Finnish Social Science Data Archive (FSD, n.d.), and the same standards are applied for TRAILS. FSD's data documentation follows the Data Documentation Initiative (DDI) Codebook 2.0 specification, which is an

Table 4: Main measures used in TRAILS at age 61 data collection in comparison with the measures used in JYLS from ages 8 to 50, as indicated by referring to the age of measurement^a

Measure	Reference	Age in years
<u>Mental well-being</u>		
Satisfaction with different domains of life (LSQ)	Kokko et al, 2013	27, 36, 42, 50, 61
Satisfaction with Life Scale (PI)	Diener et al, 1985	50, 61
Mood line (PI)	Perho and Korhonen, 1993	36, 42, 50, 61
Brief Mood Introspection Scale (PI)	Mayer and Gaschke, 1988; Feldman, 1995	36, 42, 50, 61
Positive and Negative Affect Schedule Short Form (PI)	Watson et al, 1988; Thompson, 2007	50, 61
Scales of Psychological Well-Being (PI)	Ryff, 1989	36, 42, 50, 61
Scales of Social Well-Being (PI)	Keyes, 1998	42, 50, 61
Depression scale of General Behavior Inventory (PI)	Depue, 1987	36, 42, 50, 61
Meaning of life (PI)	Read and Suutama, 2008	50, 61
<u>Personality characteristics and personal opinions</u>		
Rating of socio-emotional behaviour ^b (LSQ)	Pitkänen, 1969; Pulkkinen, 2017	8, 14, 27, 36, 42, 50, 61
Aggression Questionnaire; modified (PI)	Pulkkinen, 1987; Buss and Perry, 1992; see also Kokko and Pulkkinen, 2005	36, 42, 50, 61
Ambivalence Over Emotional Expressiveness Questionnaire; modified (PI)	King and Emmons, 1990	36, 42, 50, 61
Psychoticism Scale of the Eysenck Personality Questionnaire; modified (PI)	Eysenck and Eysenck, 1975; Haapasalo, 1990	27, 50, 61
Karolinska Scales of Personality (MI)	Schalling, 1986	36, 42, 50, 61
Big Five Personality Inventory ^c (MI)	Costa and McCrae, 1985	33, 42, 50, 61
Schwartz Value Survey (MI)	Schwartz, 1992; see also Puohiniemi, 1995; Hietalahti et al, 2015	50, 61
Self-Esteem Scale (PI)	Rosenberg, 1965	36, 42, 50, 61
Regrets (PI)	Jokisaari, 2007	50, 61
Identity Status Interview (PI)	Marcia, 1966; see also Fadjukoff, 2007	27, 36, 42, 50, 61
<u>Personal development and goal engagement</u>		
Generativity and Integrity Scales (LSQ)	Ryff and Heincke, 1983	42, 50, 61
Personal Control Inventory (LSQ)	Pulkkinen and Rönkä, 1994	27, 36, 42, 50, 61
Goal Pattern Schedule (PI)	Staudinger and Fleeson, 1996	36, 42, 50, 61
Future Life Goals; modified (PI)	Little, 1983; Saajanaho et al, 2016	61
Goal Adjustment (LSQ)	MIDUS-II; MIDUS-I; Wrosch et al, 2000	61

(Continued)

Table 4: Continued

Measure	Reference	Age in years
<u>Perceptions of ageing and the future</u>		
Subjective age (PI)		50, 61
Attitudes Towards Own Aging subscale from the Philadelphia Geriatric Center Morale Scale (PI)	Liang and Bollen, 1983 ; Levy et al, 2002	50, 61
Perceived age discrimination (PI)	Klaus et al, 2017 ; Rantanen et al, 2018	61
Brief Scale Domain-Specific Preparation for Age-Related Change (PI)	Kornadt et al, 2020 ; see also Kornadt and Rothermund, 2014	61
Future Time Perspective scale (PI)	Carstensen and Lang, 1996 ; Lang and Carstensen, 2002	61
<u>Marital and family relations, care, and other social relations</u>		
Family structure, demographics, relations to children, grandchildren, and own parents (LSQ, PI)		8, 14, 27, 36, 42, 50, 61
Quantity and quality of social relations (LSQ, PI)		8, 14, 27, 36, 42, 50, 61
Questions about marital quality (PI)		42, 50, 61
Providing help or care for other people (LSQ)		61
Social Provision Scale (PI)	Cutrona and Russell, 1987 ; see also Lyra and Heikkinen, 2006	50, 61
Solidarity across Generations (PI)	Bengtson and Roberts, 1991	36, 42, 50, 61
<u>Work and retirement</u>		
Work and retirement situation (LSQ, PI)		27, 36, 42, 50, 61
Income (LSQ)		42, 50, 61
Uncertainty of employment	Statistics Finland, n.d.	36, 42, 50, 61
Job Skill Discretion (PI)	Karasek, 1985	42, 50, 61
Control at work (PI)	Ahola et al, 1995	36, 42, 50, 61
Work engagement (PI)	Schaufeli et al, 2006 ; 2019	50, 61
Workaholism (PI)	Schaufeli et al, 2008 ; 2009	50, 61
Time demands at work (PI)	Karasek, 1979 ; Elo et al, 1990	36, 42, 50, 61
Job Exhaustion (PI)	Maslach and Jackson, 1986	36, 42, 50, 61
Recovery from work (PI)	Sonnentag and Fritz, 2007 ; Kinnunen et al, 2011	50, 61
Work-family interaction (PI)	Frone et al, 1992 ; Netemeyer et al, 1996 ; van Steenbergen et al, 2007	36, 42, 50, 61
Significance of work (PI)	Kahn and Wiener, 1967	36, 42, 50, 61
Subjective Career Success Inventory (PI)	Shockley et al, 2016	61
Actual and intended retirement age (PI)		42, 50, 61
Intended professional or voluntary activities after retirement, thoughts about retirement (PI)		50, 61
<u>Life events</u>		

(Continued)

Table 4: Continued

Measure	Reference	Age in years
Life History Calendar (PI)	Caspi et al, 1996	42, 50, 61 ^d
<u>Leisure activities</u>		
Participation in leisure activities (LSQ, PI)		14, 27, 36, 42, 50, 61
<u>Digitalisation</u>		
Quantity and frequency of the use of modern technology (LSQ)		42, 50, 61
Purposes for the use of modern technology (LSQ)		42, 61
Problems caused by the use of modern technology (LSQ)		42, 61
<u>Physical activity</u>		
Frequency of leisure-time physical activity (LSQ)	Karvonen et al, 2020 ; Kekäläinen et al, 2020	36, 42, 50, 61
An activity metabolic equivalent index for leisure-time physical activity (PI)	Kujala et al, 1998	61
Physical activity at work (PI)		61
Modes of leisure-time physical activity (LSQ, PI)		50, 61
Assessment of current physical activity (PI)	Hirvensalo et al, 1998	61
Assessment of physical activity during the COVID-19 pandemic	Kekäläinen et al, 2021	61
Physical activity monitoring with tri-axial accelerometer (HE)	RM42, UKK Terveyspalvelut, Tampere, Finland	61
<u>Health and health behaviours</u>		
Self-rated health (LSQ, HE)		27, 36, 42, 50, 61
Perceived stress (PI)	Elo et al, 1992	36, 42, 50, 61
Symptom Check List (LSQ)	Aro, 1988	36, 42, 50, 61
Physician diagnosed chronic diseases (LSQ, HE)	Kinnunen et al, 2005 ; Rantanen et al, 2012	42, 50, 61
Institutional care (HE)		42, 50, 61
Medication (LSQ, HE)		42, 50, 61
Hearing (HE)		61
Menopause and menopausal symptoms (HE)		50, 61
Blood pressure (HE)		42, 50, 61
Height, weight, Body Mass Index (HE)		8, 14, 27, 36, 42, 50, 61
Waist and hip circumference (HE)		42, 50, 61
Body composition (HE)	InBody 720, Biospace, Seoul, South Korea	61
Small blood count, cholesterol (total, LDL, and HDL), triglycerides, sensitive-CRP, fasting blood sugar (HE)		42, 50, 61
Sleeping patterns (HE)		61

(Continued)

Table 4: Continued

Measure	Reference	Age in years
Cigarette use (LSQ)		14, 27, 36, 42, 50, 61
Quantity and frequency of drinking (LSQ)	Pitkänen et al, 2005	27, 36, 42, 50, 61
CAGE Questionnaire (LSQ)	Ewing, 1984 ; Pitkänen, 2006	36, 42, 50, 61
Reasons for alcohol use		27, 36, 42, 50, 61
Problems caused by alcohol use		27, 36, 42, 50, 61
mm-Michigan Alcoholism Screening Test (HE)	Selzer, 1971 ; Kristenson and Trell, 1982	36, 42, 50, 61
Functioning		
Maximal isometric handgrip strength (HE)	Jamar Plus, Patterson Medical, Cedarburg, WI, USA; Rantanen et al, 2003	50, 61
Physical functioning (HE; self-evaluation at 61)		42, 50, 61
Mobility limitation (HE; self-evaluation at 61)		42, 50, 61
Injuries (HE)		42, 50, 61
Paradise Questionnaire for functional ability (HE)	Cieza et al, 2015 ; Pitkänen et al, 2020	61
CERAD Word List and Word Fluency (HE)	Welsh et al, 1994	42, 50, 61
Digit Span memory test (HE)	Schaie, 1985	50, 61
Trail Making Test (HE)	Reitan, 1958	61

Notes:

Abbreviations in parentheses indicate the data collection method at the current data collection: LSQ = Mailed Life Situation Questionnaire, PI = psychological interview, MI = mailed inventory, and HE = health examination. If the measure was used at an earlier data collection phase,^a it is indicated by referring to the age of measurement.

^aFor a complete list of methods used in earlier data collection phases, see [Pulkkinen and Kokko, 2017](#).

^bAt ages 8 and 14, the assessments were based on teacher-ratings and peer-nominations.

^cThe Big Five Personality Inventory ([Pulver et al, 1995](#)) is an authorised adaptation of the NEO Personality Inventory with 181 items (NEO-PI; [Costa and McCrae, 1985](#)) of which about one quarter were substitutes for the original American items.

^dThe age-42 Life History Calendar (LHC) covers years from 15 to 42, the age-LHC years from 42 to 50, and the age-61 from 50 until now.

international standard for describing the data generated by surveys and other observational methods in the social, behavioural, economic and health sciences. The DDI Codebook and more information about the DDI Alliance can be found on DDI Alliance’s web pages ([DDI Alliance, n.d.a, n.d.b](#)). Currently, JYU has its own data deposit system called Converis where the TRAILS metadata have been archived ([University of Jyväskylä, 2023](#)). A careful preliminary data analysis is conducted to control for any coding mistakes and outliers in the data, and the reliability and validity of the measures is reported. The JYLS data collected from age 8 to 50 are additionally stored in the FSD repository, and the TRAILS data will also be kept there in the future, by the end of 2025.

Due to the sensitivity and privacy of participant data, Finnish law dictates that the data cannot be openly shared. Access to pseudonymised TRAILS data is possible under certain conditions. The data access procedure for those researchers who are not members or collaborators of the TRAILS research team follows the protocol established for previous JYLS data. The latter is described on the FSD website ([FSD, n.d.](#)).

TRAILS data may be obtained for use in international research articles. The data are actively used by the research team and collaborators. Other qualified researchers need permission through a reasonable request from the principal investigator to use the data. Permission is granted on a case-by-case basis, with the main criteria being whether the research questions align with what participants consented to, as outlined in the research plan, can be answered using the specified data, and do not overlap with work in progress. If permission is granted, the data are generally used in collaboration with the research team members. When it comes to data delivery, pseudonymised data can be shared within the EU/ETA countries. During the delivery process, the GDPR is followed, and the recipient is expected to adhere to GDPR guidelines. Only variables relevant to the research plan are delivered from the complete TRAILS data set. These variables are shared through a secure system approved by the JYU.

In terms of data security, each participant has been assigned an identification number. The identification key is held by the TRAILS project's principal investigator and securely stored. Data files are stored on the JYU server and protected by passwords. All users of the TRAILS data must sign a data usage agreement that specifies the intended use, duration of data usage, title of work, research questions and required variables. By signing the agreement, users agree to keep the data for personal use only, maintain data confidentiality, handle the data with care, and return the data to the research team while deleting any copies from personal computers. The agreement is then submitted to the principal investigator for approval.

To date, more than 20 researchers have accessed TRAILS data (compared to approximately 160 for the entire JYLS); five international and two national publications have been based on the TRAILS (compared to approximately 190 and 115, respectively, for the entire JYLS); two doctoral theses based on TRAILS are currently in progress (with 17 completed based on the entire JYLS); and 11 masters' theses based on TRAILS have been completed or are nearing completion (compared 91 completed based on the entire JYLS; [University of Jyväskylä, n.d.](#)).

Data analyses

The main methods of the statistical analyses used to analyse the TRAILS aims 1–5 include path and regression analysis with direct, mediating and modifying effects. We mostly use continuous or Likert-type variables. To capture a transition, such as retirement or grandparenthood, we analyse changes in statuses or scores using the latent change score method. For investigating the evolution of mental well-being or personality, we apply trajectory (growth curve) models adapted for the measurement scale of the outcome variables. We will utilise Mplus ([Muthén and Muthén, 1998–2017](#)) and SPSS software.

Our approach is exploratory, and we conducted power analysis for a single coefficient at a time based on a minimal meaningful level of correlation. Some of our research questions are based on a very long-term follow-up, spanning from age 8 to 61. This poses a critical consideration in terms of statistical power. Our preliminary analysis has shown that the correlation between age-8 and age-50 personality characteristics is approximately 0.20. To obtain a rank regression coefficient significant at the 0.05 level of significance and with 80% power, we would require 193 participants. With around 200 TRAILS participants, we are confident that we will have sufficient statistical power to find statistically significant associations even for these analyses

covering the maximum time span. The analyses including mediating, moderating and confounding variables are even more exploratory in nature, as there are no studies focusing on these effects in similar populations. Consequently, it is difficult to make power calculations for them.

Our other strategies to increase the statistical power include the use of continuous (sum) or Likert-type scores as much as possible. This is in contrast to using binary clinical diagnosis variables that characterise extreme types of behaviours or states, which only represent a small proportion of a population and result in small group sizes in analyses. For instance, mental disorders occur in only a small percentage of the participants, which leads to a low number of cases. Therefore, instead of using binary clinical diagnosis of depression, we will use depressive symptoms as a continuous composite score. Regarding missing data, we plan to use suitable models adapted for the relevant missing data mechanisms (Little and Rubin, 2002), such as adjusting for mortality or using not-missing-at random models or weights.

Discussion

The TRAILS study produces new knowledge on the occurring or anticipated life transitions at the threshold of late adulthood, as well as the longitudinal pathways leading to these transitions and the relation of the transitions to an individual's well-being. Moreover, new knowledge is presented on how individual characteristics, individual environments or adjustment to societal challenges reflect on these life transitions. The variety of topics covered in the data collection is large and enables research that will lead to more thorough understanding of people's lives and development at around age 60. Instead of the traditional view of late adulthood being a time of adjusting to the physical, psychological and social changes that typically occur later in life (Hutteman et al, 2014), we are able to examine whether the beginning of late adulthood is a more healthy and psychologically satisfying period of life than previously argued. Moreover, the current data and the previous JYLS data will provide a 52-year basis for continued data collection in the future, providing possibilities to examine the predictors of satisfying and active life throughout late adulthood. A limitation of the study is a relatively small sample size, which prevents us from analysing extreme types of behaviours as binary variables and may limit the statistical power of analyses involving multiple outcome variables within the same model, as well as mediating, moderating and/or confounding factors. However, with some cautionary remarks, it seems that the TRAILS participants closely represent both the initial random sample and the respective Finnish age-cohort. This enhances the observed variability within the sample and improves the generalisability of the results at least to the respective Finnish population.

Note

¹ It should be noted that there are other studies abbreviated as TRAILS (for example, Tracking Adolescents' Individual Lines Surveys), but the present study (Developmental Psychological Perspectives on Transitions at Age 60: Individuals Navigating Across the Lifespan) is independent of them.

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Availability of data and materials

The Finnish law dictates that the TRAILS data cannot be openly shared due to the data sensitivity and privacy of participant data. It is possible for those researchers who are not members or collaborators of the TRAILS research team to access the pseudonymised TRAILS data under certain conditions. The data access procedure follows the protocol established for previous JYLS data (described on the FSD website; FSD, n.d.). The TRAILS data will be deposited to the FSD by the end of 2025.

Statement on human experimentation and informed consent

The TRAILS data collection was approved on 13 December 2019 by the Ethical Committee of the University of Jyväskylä, Finland. The participants gave their written informed consent for participation and for storing the data collected about them. The data collection was performed in accordance with the Declaration of Helsinki.

Conflict of interest

The authors declare that there is no conflict of interest.

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Appendix

The permanent addresses of the previous JYLS data collections are the following:

FSD2786 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Life History Calendar of 50-Year-Olds 2009, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2786>

FSD2617 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Self-Ratings of 50-Year-Olds 2009, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2617>

FSD2616 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Interviews of 50-Year-Olds 2009, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2616>

FSD2615 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Life Situation Questionnaire of 50-Year-Olds 2009, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2615>

FSD2619 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Medical Examinations of 50-Year-Olds 2009, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2619>

FSD2618 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Personality Tests of 50-Year-Olds 2009, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2618>

FSD2124 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Life History Calendars of 42-Year-Olds 2001, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2124>

FSD2101 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Interviews of 27-Year-Olds 1986, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2101>

FSD2034 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Interviews of 42-Year-Olds 2001, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2034>

FSD2307 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Interviews of Teachers of 14-Year-Olds 1974: Text Data, Qualitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2307>

FSD2306 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Interviews of Parents of 14-Year-Olds 1974: Text Data, Qualitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2306>

FSD2033 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Interviews of 36-Year-Olds 1995, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2033>

FSD2305 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Interviews of 14-Year-Olds 1974: Text Data, Qualitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2305>

FSD2202 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Interview of 20-Year-Olds 1980: Text Data, Qualitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2202>

FSD2200 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Interviews of 27-Year-Olds 1986: Text Data, Qualitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2200>

- FSD2201 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Medical Examinations of 42-Year-Olds 2001, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2201>
- FSD2097 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Self-Ratings and Free Time Activities of 20-Year-Olds 1980, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2097>
- FSD2109 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Self-Ratings of 42-Year-Olds 2001, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2109>
- FSD2002 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Life Situation Questionnaire of 42-Year-Olds 2001, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2002>
- FSD2120 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Personality Tests of 36-Year-Olds 1995, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2120>
- FSD2123 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Self-Ratings of 36-Year-Olds 1995, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2123>
- FSD2096 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Personality Test and TV Viewing of 33-Year-Olds 1992, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2096>
- FSD2005 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Life Situation Questionnaire of 36-Year-Olds 1995, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2005>
- FSD2121 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Personality Tests of 27-Year-Olds 1986, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2121>
- FSD2125 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Interviews of 20-Year-Olds 1980, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2125>
- FSD2074 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Interviews of the Parents of 14-Year-Olds 1974, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2074>
- FSD2025 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Life Situation Questionnaire of 27-Year-Olds 1986, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2025>
- FSD2073 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Teacher Ratings, Peer Nominations and School Reports of 14-Year-Olds 1974, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2073>
- FSD2108 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Personality Tests of 42-Year-Olds 2001, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2108>
- FSD2075 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Interviews of 14-Year-Olds 1974, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2075>
- FSD2059 Jyväskylä Longitudinal Study of Personality and Social Development (JYLS): Teacher Ratings, Peer Nominations and Personality Tests of 8-Year-Olds 1968, Quantitative, <https://urn.fi/urn:nbn:fi:fsd:T-FSD2059>

Table A1: Representativeness of the TRAILS study participants in relation to surviving non-participants from the initial study sample of the JYLS at age 8 (statistically significant *p*-values in bold)

	Women			Men		
	Non-participants (n = 58)	Participants (n = 107)		Non-participants (n = 77)	Participants (n = 99)	
	% (n)	% (n)	<i>p</i> -value	% (n)	% (n)	<i>p</i> -value
Socio-economic status of parent			.430			.924
Blue-collar	75.9 (44)	70.1 (75)		64.9 (50)	69.7 (69)	
Lower or upper white-collar	24.1 (14)	29.9 (32)		35.1 (27)	30.3 (30)	
	M (SD)	M (SD)		M (SD)	M (SD)	
School success	2.72 (1.09)	3.20 (1.00)	.006	3.05 (1.04)	3.00 (1.04)	.742
Behavioural activity	1.99 (0.75)	2.10 (0.76)	.394	2.23 (0.55)	2.03 (0.74)	.039
Well-controlled behaviour	1.50 (0.59)	1.58 (0.69)	.451	1.20 (0.77)	1.34 (0.73)	.208
Negative emotionality	0.487 (0.36)	0.40 (0.37)	.229	0.74 (0.53)	0.64 (0.47)	.181

Table A2: Representativeness of the TRAILS study participants (n = 206) in relation to surviving non-participants from the initial JYLS sample in adulthood (statistically significant *p*-values in bold)

	Non-participants women (n = 33–51)	Participants women (n = 100–107)	<i>p</i> -value	Non-participants men (n = 45–71)	Participants men (n = 93–99)	<i>p</i> -value
	% (n)	% (n)		% (n)	% (n)	
Level of vocational education at 50			.007			.035
Vocational courses or less	27.5 (14)*	10.3 (11)*		28.8 (21)	24.2 (24)	
Vocational school ^a	33.3 (17)	24.3 (26)		53.4 (39)	44.4 (44)	
Vocational college or polytechnic ^b	25.5 (13)*	47.7 (51)*		4.1 (3)*	19.2 (19)*	
University	13.7 (7)	17.8 (19)		13.7 (10)	12.1 (12)	
Occupational status at 50			.070			.114
Blue-collar	22.0 (9)	8.4 (9)		61.9 (39)	47.5 (47)	
Lower white-collar	58.5 (24)	64.5 (69)		19.0 (12)	19.2 (19)	
Upper white-collar	19.5 (8)	27.1 (29)		19.0 (12)	33.3 (33)	
Self-rated health at 36			.185			.511
Good	30.3 (10)	43.0 (43)		42.2 (19)	52.8 (47)	
Fairly good	48.5 (16)	31.0 (31)		33.3 (15)	27.0 (24)	
Average or poor	21.2 (7)	26.0 (26)		24.4 (11)	20.2 (18)	
Smoking at 27			.183			.012
Never	28.3 (13)	46.1 (47)		15.0 (9)*	33.3 (31)*	
Quitted	23.9 (11)	21.6 (22)		16.7 (10)	16.1 (15)	
Occasionally	13.0 (6)	10.8 (11)		8.3 (5)	15.1 (14)	
Daily	34.8 (16)	21.6 (22)		60.0 (36)*	35.5 (33)*	
Alcohol consumption	M (SD)	M (SD)		M (SD)	M (SD)	
Grams per year (at 27)	1,182 (1,358)	814 (1,034)	.074	3,247 (3,508)	2,421 (2,617)	.121
CAGE mean score (at 36)	1.45 (1.61)	0.71 (1.09)	.012	2.15 (2.16)	1.67 (1.72)	.145

*Adjusted residual > ±1.96.

^aLower secondary level.

^bBachelor's level.