

# Survey and 10-Day Diary Data on Infant Nutrition, Development, and Home Learning Environment during the COVID-19 Pandemic from the LEARN-COVID Pilot Study



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DATA PAPER

TILMAN REINELT

CLARISSA FREY

REBECCA OERTEL

DEBORA SUPPIGER

GIANCARLO NATALUCCI

\*Author affiliations can be found in the back matter of this article

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## ABSTRACT

The LEARN-COVID pilot study collected data on infants and their parents during the COVID-19 pandemic. Assessments took place between April and July 2021. Parents ( $N = 357$ ) from Switzerland (predominantly), Germany, and Austria answered a baseline questionnaire on their behaviour related to the pandemic, social support, infant nutrition, and infant regulation. Subsequently, parents ( $n = 222$ ) answered a 10-day evening diary on infant nutrition, infant regulation, parental mood, and parental soothing behaviour. Data and documentation are stored on Zenodo, <https://doi.org/10.5281/zenodo.6946048>. These data may be valuable to researchers interested in infant development and parenting during the pandemic as well as to researchers interested in daily variability in infant behaviour, parenting, and nutrition.

## CORRESPONDING AUTHOR:

**Tilman Reinelt**

University of Zurich, CH

[tilman.reinelt@uzh.ch](mailto:tilman.reinelt@uzh.ch)

## KEYWORDS:

COVID-19; infant; parent; diary; regulation

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## BACKGROUND

The COVID-19 pandemic poses challenges for both parents and children. Countries implemented several measures to stop the spreading of the virus, reduce the number of cases, and keep their population healthy. Across the world, compulsory use of masks, the reduction of social contacts, mandatory working from home, and the lockdown of several businesses, kindergartens, and schools have been among the most common interventions (Koh, 2020; Nussbaumer-Streit et al., 2020). So far, studies on how these interventions or a COVID-19 infection affect children and their parents mainly focused on school-aged or preschool-aged children. These studies were mainly conducted during the first phase of the pandemic in Spring 2020 when the predominant measure in most countries was a lockdown (e.g., Fosco et al., 2022; Ravens-Sieberer et al., 2021). Less is known about the well-being and development of infants and their parents during the pandemic, particularly after Spring 2020.

Regardless of the pandemic, the transition to parenthood already is a particularly stressful period for parents as they need to adjust to the new situation and care for a child (Epifanio et al., 2015). Parents often rely on external sources (both professional and within the family and friends) when learning how to interpret their infant's signals and needs, and gaining confidence in their parenting abilities (Leahy-Warren et al., 2012). Measures of social distancing likely reduced parental resources of social support. In addition, parental stress levels increased during the pandemic (Huebener et al., 2021). According to the Family Stress Model (Masarik & Conger, 2017), increased stress levels diminish the parent's ability to adequately tend to their infants' needs (Feldman et al., 2004). Indeed, data from Germany indicated that during the first lockdown in spring 2020, higher parental stress levels were related to fewer parent-child activities in families with children up to the age of six years (Oppermann et al., 2021). Likewise, parents in Singapore who felt more impacted by the pandemic were stricter with their children compared to parents who felt less affected by the pandemic (Chung et al., 2020). Less sensitive, and harsh parenting are among the strongest predictors for infant regulatory problems (e.g., excessive crying, feeding problems, or sleeping problems) and early child externalizing behaviour problems (Reinelt et al., 2019; Samdan et al., 2020). Thus, investigating the effects of the pandemic on early child development and in particular on infant regulatory problems is important (Provenzi & Grumi, 2022).

Feeding problems are frequent regulatory problems in infancy (Samdan et al., 2020). For instance, some infants have problems latching on their mother's breast, feeding might take a long time, and some mothers suffer from cracked nipples or mastitis. Such feeding problems often lead to mothers stopping to feed their infants with human milk (Fein et al., 2008). Yet, human milk has been related

to various favorable child outcomes, including health, cognitive development, and temperament (Niegel et al., 2008; Victora et al., 2016). Changes in mothers and fathers staying at home due to the pandemic might alter child feeding practices. For instance, it might be easier to combine work and breastfeeding whilst working from home. Furthermore, as fathers were able to spend more time with their young children, they might want to get involved more in feeding practices. Hence, the pandemic might have changed child feeding and feeding practices among parents. Indeed, data from the UK demonstrated an increased involvement of fathers in childcare during the pandemic, if they worked from home or became unemployed (Sevilla & Smith, 2020). Nevertheless, in many families mothers' care work increased even with fathers working from home (Jessen et al., 2021). However, these studies usually included families with older children (e.g., up to the age of 14). Thus, it is unclear to what extent these results apply to families with newborns or infants during the first year of life.

The present data set derives from a study investigating infant regulation as the primary outcome of parental behaviour and coping during the pandemic. The data set contains a newly created set of items on how parents respond to the COVID-19 pandemic. These items assess infection status and whether families had to quarantine. However, whereas many other questionnaires on the COVID-19 pandemic focused on general stressors (e.g., working from home, loss of job, exposure to the virus) (Brown et al., 2020; Grasso et al., 2021), this data set also contains items on parents' pandemic-related thoughts, feelings, and behavior (e.g., wearing masks, meeting with other families, using public transport, not cuddling with their infant; for similar items see Briggs-Gowan, Carter et al., 2020; Briggs-Gowan, Muzik et al., 2020). The questionnaire also includes items specific to the pregnancy period and postpartum (e.g., being afraid of partners missing the birth due to COVID-19 protocols). Thus, this data set offers insights into how the COVID-19 pandemic specifically affects parents of newborns and infants.

In addition, the data set contains information on various potential moderator and mediator variables linking the parents' responding to the pandemic to parental well-being and child development. These variables include social support, parenting behaviour, particularly regarding feeding practices, and parental well-being. With regard to infant development, the data set includes measures of infant regulation (i.e., problems regarding crying, feeding, and sleeping) and media exposure.

Finally, this data set is unique as it also includes measures from a 10-day evening diary focusing on infant nutrition, infant regulation and temperament, and parental soothing strategies. Thus, the present study combined a cross-sectional observational approach with a measurement burst (e.g., short evening questionnaires for 10 days) (Sliwinski, 2008). Such intensive longitudinal

studies are better able to capture the temporal dynamics of how parental stress and well-being relate to parenting and child development than cross-sectional studies or panel studies (Nesselroade, 1991). For instance, an intensive longitudinal study on parents of school-aged children in Germany during the pandemic revealed that on days when parents were more involved in the child's schoolwork, negative affect was increased among children and their parents, and parent-child interactions were rated more negatively compared to days on which children did their schoolwork more independently (Schmidt et al., 2021). However, so far, there are no intensive longitudinal studies on infant behaviour and development – neither during the pandemic nor before. Data from the present study offer the possibility to assess daily variations in infant behaviour and parenting. In addition, the psychometric properties of these daily assessments can be investigated in more detail.

## METHODS

### STUDY DESIGN

The study was a cross-sectional observational study (baseline questionnaire) followed by a 10-day intensive longitudinal diary study to assess daily within-person variation in infant behaviour and parenting. All data were assessed via online questionnaires. Participants were parents of infants under the age of 18 months, who were fluent in German. Parents self-selected to participate after being contacted by e-mail (if participants gave birth at the University Hospital Zurich). In addition, the study was advertised on social media. The final sample consisted of parents from Switzerland (mainly), Germany, and Austria.

The LEARN-COVID study was originally planned to pilot or shorten German versions of questionnaires or German translations of questionnaires on early child development, parenting, social support, and nutrition for later use in a large-scale longitudinal study. A special focus was on selecting items from psychological (trait) measures (e.g., early child regulation, temperament, parental soothing strategies) to be used in daily diary (state) assessments. Items on COVID-19 infection status, behaviour while being infected or in quarantine, and how parents perceived the pandemic were added to the baseline questionnaire.

### TIME OF DATA COLLECTION

Data were collected between April and July 2021.

### LOCATION OF DATA COLLECTION

Data were collected online via EFS Survey/Unipark (QuestBack GmbH, 2020). The QuestBack server park is located in Bremen, Germany. It is a BSI-certified data center meeting the requirements of ISO 27001 standard. Data collection was restricted to German-speaking parents. However, recruitment efforts mainly targeted parents from the Zurich metropolitan area (Zurich, Switzerland).

### SAMPLING, SAMPLE, AND DATA COLLECTION

Participants were mainly recruited by contacting parents via e-mail who gave birth at the University Hospital Zurich during the last 18 months before the start of the study. Contacts were restricted to parents who had given a general consent to be contacted for study purposes. In addition, the study was advertised on social media (Facebook, Instagram) to parents from Switzerland, Germany, and Austria. Thus, the study advertisement primarily focused on Switzerland but was open to any German-speaking parent of an infant under the age of 18 months. In particular, we expected parents from Germany and Austria to participate as well. All data and consent were assessed via online questionnaires implemented in EFS Survey/Unipark (QuestBack GmbH). A total of  $N = 361$  parents participated in the baseline questionnaire. Four of these participants were excluded as they provided no data on any of the COVID-19 items, reducing the sample size to  $n = 357$ . Of the remaining participants,  $n = 279$  (78.2%) finished the baseline questionnaire and  $n = 222$  (62.2%) parents participated in at least one evening diary. Demographic data for participants answering the baseline questionnaire and at least one evening diary are presented in Table 1. However, six of these participants could not be linked to the baseline data as neither their e-mail address nor the infant's date of birth given in the diary matched any data entry in the baseline survey. Table 2 shows the number of participants who participated in the evening diary for a given number of days ( $Mdn = 8$  days).

### MATERIAL/ SURVEY INSTRUMENTS

With the exception of the COVID-19 items, which were self-constructed, all questionnaires have been used in previous studies. If available, German versions of questionnaires were used. In specific cases changes to the German questionnaires were made to adapt to the Swiss context (e.g., when assessing the language proficiency of both High German and Swiss German). If there was no German version of a questionnaire, the original questionnaire was translated from English to German, and translations were checked by two other independent researchers. In the case of disagreement, translations were discussed by three people until a consensus was reached.

#### Baseline questionnaires

**Demographics.** Demographic information includes items on parental characteristics: age, gender, education, weekly working hours, country of birth, country of residence, and monthly salary. Items on education and weekly working hours have been derived from the Swiss Household Panel (Tillmann et al., 2016). Working hours were further specified by asking about working hours at home and whether parents had to care for their children simultaneously. Salary was assessed as the average monthly income after taxes. As income is a sensitive topic, we did not ask for the exact income but whether the

	SAMPLE BASELINE		SAMPLE DIARY	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Child age (days)	282.57	146.65	289.01	142.35
Gestational age at birth (weeks)	38.65	3.36	39.00	2.37
Parental age (years)	34.66	4.68	34.97	4.30
Monthly household income after taxes (median category) in CHF <sup>a</sup>	10'100 – 12'000			
	<i>n</i>	%	<i>n</i>	%
Child sex				
Female	180	50.4	114	52.8
Male	177	49.6	102	47.2
Parent gender				
Female	337	94.4	210	97.2
Male	20	5.6	6	2.7
Educational level				
<tertiary	90	25.2	38	17.6
≥tertiary	267	74.8	178	82.4
Country of residence				
Switzerland	342	95.8	204	94.4
Other	15	4.2	12	5.6
Migration background <sup>b</sup>				
yes	162	45.4	104	48.1
no	195	54.6	112	51.9

**Table 1** Demographic data of the baseline sample and the diary sample.

Note: <sup>a</sup>Income was assessed based on the categories of the European Social Survey; currencies other than CHF were transformed into the equivalent CHF categories. <sup>b</sup>A person was considered as having a migration background if the person was born outside the country of residence.

NUMBER OF DAYS									
1	2	3	4	5	6	7	8	9	10
<i>n</i> = 33	<i>n</i> = 12	<i>n</i> = 17	<i>n</i> = 14	<i>n</i> = 14	<i>n</i> = 10	<i>n</i> = 9	<i>n</i> = 17	<i>n</i> = 21	<i>n</i> = 75

**Table 2** Number of days participants participated in the evening diary.

income falls into a specific category. Different categories were offered to participants staying in Switzerland/Liechtenstein, Germany, and Austria to cover different currencies and spending power. Categories were derived from the European Social Survey 2018 (ESS Round 9). Thus, using items from established panel studies enables the comparison of the present sample to representative data.

With regard to migration background, we also assessed the parents' language proficiency by adapting items from the German National Educational Panel Study (NEPS; Blossfeld & Roßbach, 2019). Adaptations include the additional category of Swiss German.

Regarding the infant, age, gestational age at birth, and sex were assessed. Household indicators included the number of people in the household, differentiating between adults and children.

**COVID-19 status and response to the pandemic.** The questionnaire on COVID-19 consisted of three parts. In the first part, participants indicated whether they or someone in their household belonged to a COVID-19 risk group. In addition, parents indicated whether (a) during the pregnancy or (b) after the infant's birth anyone in their household, family, or friends had been diagnosed with COVID-19 or was suspected to have COVID-19 (e.g., because of contact with a person tested positively for COVID-19 or having symptoms but without a test result yet (Cohen et al., 2020)).

Second part: If a member of the household was infected with COVID-19 or was suspected to be infected, the participant was asked to indicate how the infected person behaved. Items were answered on a 5-point Likert scale ranging from 1 (does not apply at all) to 5 (applies fully). Items were created by three expert interviews and

discussions within the research team. An example would be 'Avoided physical contact with your baby'. In total, 12 items had been created for the primary respondent, nine items for the partner of the respondent, and four items with regard to the infant's potential siblings.

In the third part, all participants worked on 28 items on how they coped with the pandemic, and – if the delivery happened during the pandemic – on 16 additional items on how they perceived social support during pregnancy and after giving birth. Items were created based on the same three expert interviews and answered on a 5-point Likert scale ranging from 1 (does not apply at all) to 5 (applies fully). Example items include 'My child and I have met with other families with children' and 'I felt well informed about the possible risks of a COVID-19 infection for pregnant women'.

**Parental well-being.** Parental well-being was assessed by the WHO-5 well-being index (WHO, 1998). The self-reported scale consists of five items which are answered on a 6-point Likert scale with higher values indicating better well-being. Sum values below 13 indicate clinical depression (Topp et al., 2015). Internal consistency was high ( $\omega = .87$ ) and the mean sum value was  $M = 18.80$  ( $SD = 5.29$ ). A total of  $n = 49$  participants (13.7%) scored below the clinical cut-off.

**Gender-role attitudes.** Attitudes toward gender roles were captured by five items. Each item was scored on a 5-point Likert scale ranging from 1 = *do not agree at all* to 5 = *fully agree* (Braun, 2014). The internal consistency of the scale was  $\omega = .77$  with participants' mean score being  $M = 1.92$  ( $SD = 0.76$ ).

**Infant Feeding Attitudes.** Attitudes towards infant feeding were assessed by the Iowa Infant Feeding Attitudes Scale (IIFAS; De La Mora et al., 1999). The IIFAS consists of 17 items that are rated on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Nine items are worded favourable towards formula feeding, the remaining eight items are favourable towards breastfeeding. The internal consistency of the scale was  $\alpha = .75$  with participants' mean sum score being  $M = 60.24$  ( $SD = 7.72$ ) (13.7%). To calculate this mean score, items in favour of formula feeding have been reverse coded so that the mean score reflects a mother's attitude towards breastfeeding.

**Reasons for weaning.** A total of 21 typical reasons for weaning were derived from a US and a Swiss study on infant feeding (Infant Feeding Practices Study II, Fein et al., 2008; Swiss Infant Feeding Study, Gross et al., 2014). Examples of possible reasons include 'My baby had problems with sucking', 'I didn't have enough milk', or 'Breastfeeding was too tiring'. Parents rated the importance of each reason for their decision to wean on a 4-point scale from 1 (not at all important) to 4 (very important).

**Parental investment.** The socio-emotional parental investment was assessed by three subscales of the Parental Investment in Child Scale (Bradley et al., 1997).

Items were answered on a 6-point scale ranging from 1 (never) to 6 (always). Higher values of the subscale Delight (6 items,  $\omega = .56$ ,  $M = 4.44$ ,  $SD = 0.67$ ) are indicative of parents who take greater pleasure from interacting with their child or thinking about their child. Higher values of the subscale Knowledge/Sensitivity (5 items,  $\omega = .75$ ,  $M = 2.96$ ,  $SD = 0.86$ ) reflect parents who are less concerned about their infant's needs. Finally, higher values of the subscale Separation Anxiety (5 items,  $\omega = .79$ ,  $M = 3.11$ ,  $SD = 1.10$ ) refer to parental worrying when a child is alone or cared for by other people.

To assess parents' investment of resources, parents were asked to distribute a fictive amount of money. They were told to imagine having won 300 CHF (or 200 €). Subsequently, they had to spend the money on different people (task adapted from Bugental et al., 2010). They could distribute the money between themselves, their partner, their baby, the baby's siblings, or another person. The amount of money varied for CHF and Euro to account for spending power and currency.

**Social networks.** To assess the characteristics of the participant's social networks, we asked them to name the initials of up to three people that are particularly important to them (Diewald et al., 2006). To ensure anonymity, the initials were all replaced by the same code ('AA', 'BB', 'CC', respectively). Subsequently, participants were asked five questions with regard to these people: their age and gender, whether they were related, whether they have children of their own, and whether they have ever breastfed.

**Social support.** The Perinatal Infant Care Social Support scale was used to assess social support specifically with regard to infant care (Leahy-Warren et al., 2019). The scale consists of two parts. The first part assesses functional social support and consists of 19 items rated on a 4-point Likert scale from 1 (strongly disagree) to 4 (strongly agree). Of these 19 items, 9 items can be allocated to a factor 'supporting presence' ( $\alpha = .76$ ,  $M = 3.29$ ,  $SD = 0.44$ ) and 10 items can be allocated to a factor 'practical support' ( $\omega = .93$ ,  $M = 3.20$ ,  $SD = 0.71$ ). Supporting presence represents the social network of a person to get support (e.g., 'I have someone to care and comfort me'), whereas practical support refers to the possibility to get information and help with concrete problems (e.g., 'I can get information on infant changing/dressing'). However, due to a programming error, one item on practical support ('I can get hands-on help with infant changing/dressing') was not implemented in the current study.

The second part of the instrument assesses a structural component of social support. Participants indicate whether they receive support from a person and which type of support they receive (informational support, instrumental support, emotional support, and appraisal support). Persons can either represent the informal social net (i.e., partner, parents, parents-in-law, siblings, friends, or neighbours) or the formal social net

(i.e., doctor, midwife, nurse). The type of support for each person is measured by a checkbox.

**Infant regulation.** Infant regulation was assessed by the Questionnaire for Crying, Sleeping, and Feeding (Groß et al., 2013). Parents reported on a 4-point Likert scale how often their child displays certain regulatory problems (e.g., crying for more than 30 minutes) or how much they are bothered by their child's behavior. The total scale consists of 49 items ( $\omega = .91$ ,  $M = 1.79$ ,  $SD = 0.32$ ), which comprise subscales on crying, whining, and sleeping (24 items,  $\omega = .84$ ,  $M = 1.73$ ,  $SD = 0.39$ ) as well as feeding (13 items,  $\omega = .80$ ,  $M = 1.39$ ,  $SD = 0.35$ ), and co-regulation (12 items,  $\omega = .95$ ,  $M = 2.32$ ,  $SD = 0.59$ ). One item was added to this questionnaire complex to assess the total duration of sleep on an average day combining the infant's sleep during the day and night.

**Soothing strategies.** Parental soothing strategies were derived from a previous study on infant soothing and have been used in a German longitudinal study (Dayton et al., 2015; Schütte et al., 2020). Parents rated on a scale from 1 (never) to 6 (multiple times a day) how often they use a specific strategy to calm their child if it was crying. An example of a soothing strategy is 'I carry my child around'. The questionnaire contains nine strategies. Parents could fill in (and rate) a tenth strategy in an open text field.

**Media exposure.** The infant's exposure to digital media was assessed by four items derived from a Canadian study that have recently been used in a German longitudinal study (Archer, 2017; Schütte et al., 2020). Items ask how frequently an infant is exposed to digital media (6-point scale from 1 = never to 6 = several times a day), how long a typical exposure lasts (6-point scale from 1 = less than 5 minutes to 6 = 61 minutes and more), how interested an infant is in this type of media compared to the first time the infant was introduced to the media (5-point scale from 1 = now clearly less interested to 5 = now clearly more interested), and how often and for what reason infants are exposed to digital media (5-point scale from 1 = never to 5 = several times a day). The following types of media are assessed: television, television in the background, laptop, tablet, and smartphone. Reasons for use include educational purposes, to distract the infant, to calm the infant, and to keep the child busy.

### Diary questionnaires

**Nutrition.** For infants younger than 180 days, parents indicated whether the infant was breastfed, fed with human milk from the bottle, or fed with formula (Gross et al., 2014). For each feeding practice, parents indicated how often the infant received this type of nutrition. With regard to bottle-feeding (either with human milk or formula), parents additionally reported on the quantity of milk (in ml). Parents of older infants additionally could choose from several options of solid food and how often the infant consumed this type of food. This assessment is similar to the assessment of infant nutrition in the Swiss

Infant Feeding Study (Gross et al., 2014). Furthermore, we asked for the average (Fein et al., 2008), shortest, and longest duration of the infant's meal time.

**Feeding difficulties.** Parents indicated whether or not they experienced specific feeding difficulties. Parents received different lists of feeding problems depending on their feeding method (i.e., breastfeeding, human milk from the bottle, formula, solid food). Items on difficulties with breastfeeding and milk pumping were derived from previous studies (Fein et al., 2008; Gross et al., 2014; Qi et al., 2014). If possible, the same items (e.g., 'I was very exhausted') or adapted versions (e.g., 'The child did not want to suck' vs. 'The child did not want to eat') were used for the other feeding practices as well. Parents, who breastfed their child received 11 items, parents who pumped milk received 12 items, and parents who did both received 15 items. In contrast, parents feeding their infant with formula only received 7 items, and parents feeding solid food received 6 items.

**Parental affect.** Parents rated to what extent they experienced different emotional states during the day. The ten states refer to positive affect (happy, cheerful, relaxed, balanced), negative affect (afraid, angry, sad, worried), and arousal (exhausted, lively) and are each rated on a 7-point Likert scale ranging from 1 = not at all to 7 = very. The scale has been used previously in an intensive longitudinal study on parenting during the pandemic (Neubauer et al., 2021). To specifically assess parental affect during feeding situations (e.g., during breastfeeding) parents answered the same items at a later point during the diary, yet at that time the instruction specifically referred to the feeding situations during the day ("When you think about your child's meals, how did you feel during feedings?").

**Infant regulation.** Daily infant regulation was assessed by a subset of items from the Questionnaire for Crying, Sleeping, and Feeding (Groß et al., 2013). Items were reformulated to apply to the current day. In contrast to the baseline questionnaire, items were answered on a binary scale. Parents only indicated whether a certain regulatory problem occurred that day. The scale consisted of 21 items. Another four items (e.g., on night awakenings) can be derived from other items (e.g., on sleep behaviour or feeding difficulties).

Sleep behaviour was assessed by four items. Parents indicated the total amount of hours an infant was asleep that day (day and night sleep), how long it took the infant to fall asleep during the day and at night, and how often the child woke up during the night.

**Temperament.** Daily temperament states were assessed by the German version of the Infant Behavior Questionnaire (IBQ) used in the NEPS (Bayer et al., 2015). This version of the IBQ consists of nine items which are answered on a 7-point Likert scale from 1 (never) to 7 (always). The items form two subscales: negative affectivity (4 items) and orienting/regulatory capacity (5

items). In contrast to the regular IBQ, this version does not contain a surgency/extraversion component as this dimension did not show sufficient internal consistency and was therefore eliminated from the temperament scale implemented in the NEPS (Bayer et al., 2015).

**Soothing strategies.** The scale consisted of the same nine strategies as the scale in the baseline questionnaire (Dayton et al., 2015; Schütte et al., 2020). However, instead of rating how frequently parents used the strategies to calm their child, parents were asked to indicate, whether they used the strategy this day at all (binary answer: yes vs. no). In addition, an item was added, so that parents could indicate if their child did not cry that day and thus, did not need to be soothed.

### QUALITY CONTROL

Data were collected through EFS Survey/Unipark (Questback GmbH) which meets the data protection and security requirements of ISO 27001. If participants did not answer a question, they received a message asking them to indicate whether they did not want to answer this item. They then could choose whether they wanted to respond or not.

Data were screened for obvious errors (e.g., a parental age > 100 years). If possible, these errors were corrected, else they were classified as missing data. In addition, any identifiable information was removed. No further measures for quality control were undertaken. However, parents were asked for their German knowledge to control for possible language difficulties, thus allowing researchers to control for language proficiency.

### DATA ANONYMISATION AND ETHICAL ISSUES

The ethical board of the Kanton Zurich reviewed the study protocol and considered the study uncritical. All participants indicated their consent and received a digital copy of the informed consent form. Within this consent, they were informed that participation was voluntary, and they did not need to answer a question if they did not want to. In addition, participants agreed that anonymized records of their data might be transferred to a data repository. To anonymize the data, e-mail addresses and birth dates were removed. As age is a critical variable in infant research, we decided to report the infant's exact age in days. Consequently, to prevent inference of the exact date of the infant's birth and thus de-anonymisation of the data, the date of measurement was aggregated at the calendar week level.

### EXISTING USE OF DATA

No publications to date (August 10, 2022).

## DATASET DESCRIPTION AND ACCESS REPOSITORY LOCATION

Data and documentation are stored on Zenodo, <https://doi.org/10.5281/zenodo.6946048>.

### OBJECT/FILE NAME

Data and documentation include two data files ("LEARN\_COVID\_survey.csv" and "LEARN\_COVID\_diary.csv"), two codebooks ("Codebook\_survey\_LEARN\_COVID\_v1.1.pdf" and "Codebook\_diary\_LEARN\_COVID\_v1.1.pdf") and a README file including relevant meta-data ("LEARN\_COVID\_readme.txt").

### DATA TYPE

Data are primary data. Data have been anonymized and screened for obvious errors (e.g., within-infant variation of the infant's age of one year). In that case, data has been cleaned or coded as missing.

### FORMAT NAMES AND VERSIONS

Data files are provided as .csv files, codebooks are provided in a .pdf format.

### LANGUAGE

Codebooks are in English. Items in the codebooks are in English and German. Free text answers from participants (e.g., special food they prepared for their child, general remarks) and a coding sheet for country codes are in German.

### LICENSE

We deposited the data under a Creative Commons Attribution 4.0 International License (CC BY 4.0).

### LIMITS TO SHARING

There are no embargoes or limits to sharing the data.

### PUBLICATION DATE

The data were published on 30-03-2022. Documentation in the codebooks has been revised on 31-07-2022. Changes in the documentation are reported in the file LEARN\_COVID\_changelog.txt.

### FAIR DATA/CODEBOOK

Meta-data are reported in the LEARN\_COVID\_readme file published as a plain text document. The codebooks include – besides variable names, item content, and response format – references to priorly published versions of each measure. All files are stored on Zenodo, a repository adhering to the FAIR guiding principles.

## REUSE POTENTIAL

There are multiple uses for this dataset. First, data can be used to analyse the impact of COVID-19 infections/quarantine and how parents coped with the pandemic on various aspects of infancy, namely nutrition, parental investment and soothing strategies, and infant regulation. In particular, the effects of the COVID-19 pandemic have mainly been investigated in (pre-)school-aged children.

Effects on early child development are rather unknown, although results from Italy demonstrate that increased maternal stress and anxiety are related to reduced mother-infant bonding and increased infant regulatory problems (Provenzi et al., 2021). This data set includes several potential moderator and mediator variables to investigate under which conditions parental well-being and response to the pandemic might impact infant development.

Second, the dataset offers the possibility to investigate infant regulation and its predictors on different time scales. For instance, while breastfeeding has been related to infant temperament, cognitive development, and more sensitive parenting, these studies relied on relatively long-time frames (i.e., months or years) (Niegel et al., 2008; Kim et al., 2011; Victora et al., 2016). However, infants drink multiple times a day. Thus, one could assume that the effects of breastfeeding might manifest on a daily level. Furthermore, temperament is usually considered a biological driven trait that is a precursor of personality (Shiner, 2019; Tang et al., 2020). However, as current theories of personality psychology (i.e., whole trait theory; Fleeson & Jayawickreme, 2015) suggests that personality traits can best be understood as a reflection of a density distribution of personality states, temperament can also be understood as a reflection of a density distribution of temperamental states. The present data is the first data set to offer the possibility to test temperamental states and daily variations in infant regulation which then can be related to variations in parenting and nutrition. Thereby, the present data set can be useful to researchers from different disciplines, for instance, developmental psychology, pediatrics, or personality psychology.

Finally, the analysis of within-person variability and within-person couplings of constructs (e.g., within-person associations of parenting and infant regulation) require psychometric sound measures (Neubauer et al., 2020). This study offers data on several constructs (parenting, temperament, infant regulation) that might be used to develop psychometrically sound scales for a within-person assessment.

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## COMPETING INTERESTS

The authors have no competing interests to declare.

## AUTHOR CONTRIBUTIONS

TR and GC planned the study and obtained ethics approval. TR, CF, and RO translated measures. CF and RO programmed the online survey and recruited participants. TR prepared the data set. TR, DS, CF, and GN wrote and revised the manuscript.

## AUTHOR AFFILIATIONS

**Tilman Reinelt**  [orcid.org/0000-0003-0951-5927](https://orcid.org/0000-0003-0951-5927)

Family Larsson-Rosenquist Foundation Center for Neurodevelopment, Growth, and Nutrition of the Newborn, Department of Neonatology, University Hospital Zurich, University of Zurich, CH

**Clarissa Frey**

Family Larsson-Rosenquist Foundation Center for Neurodevelopment, Growth, and Nutrition of the Newborn, Department of Neonatology, University Hospital Zurich, University of Zurich, CH

**Rebecca Oertel**

Family Larsson-Rosenquist Foundation Center for Neurodevelopment, Growth, and Nutrition of the Newborn, Department of Neonatology, University Hospital Zurich, University of Zurich, CH

**Debora Suppiger**  [orcid.org/0000-0003-2330-7649](https://orcid.org/0000-0003-2330-7649)

Family Larsson-Rosenquist Foundation Center for Neurodevelopment, Growth, and Nutrition of the Newborn, Department of Neonatology, University Hospital Zurich, University of Zurich, CH

**Giancarlo Natalucci**  [orcid.org/0000-0003-0225-2431](https://orcid.org/0000-0003-0225-2431)

Family Larsson-Rosenquist Foundation Center for Neurodevelopment, Growth, and Nutrition of the Newborn, Department of Neonatology, University Hospital Zurich, University of Zurich, CH

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**Victoria, C. G., Bahl, R., Barros, A. J. D., França, G. V. A., Horton, S., Krasevec, J., Murch, S., Sankar, M. J., Walker, N., Rollins, N. C., Allen, K., Dharmage, S., Lodge, C., Peres, K. G., Bhandari, N., Chowdhury, R., Sinha, B., Taneja, S., Giuliani, E., ... Richter, L.** (2016). Breastfeeding in the 21st century: Epidemiology, mechanisms, and lifelong effect. *The Lancet*, 387(10017), 475–490. DOI: [https://doi.org/10.1016/S0140-6736\(15\)01024-7](https://doi.org/10.1016/S0140-6736(15)01024-7)

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