

Article

## The Role of Spatial Context in Shaping Adolescents' Peer Relationships

Mats Beckmann<sup>1</sup>, Katharina Knüttel<sup>1</sup>, Sören Petermann<sup>1,2,\*</sup>, and Till Stefes<sup>2</sup>

<sup>1</sup> Zentrum für interdisziplinäre Regionalforschung (ZEFIR), Ruhr University Bochum, Germany

<sup>2</sup> Faculty of Social Science, Ruhr University Bochum, Germany

\* Corresponding author (soeren.petermann@rub.de)

Submitted: 16 February 2022 | Accepted: 6 May 2022 | Published: 20 September 2022

### Abstract

This article explores the role of neighbourhoods as a spatial context for peer relationships among adolescents. We examine the correlations between neighbourhood composition and places suitable for young people for friendship intimacy and peer belonging. We hypothesise that favourable demographic and social neighbourhood compositions, knowledge, and use of places suitable for young people, as well as the spatial appropriation of such places, promote peer relationships. The present study carries out empirical testing of the spatial hypotheses with survey data from adolescents (N = 3225) in two German cities with 30 neighbourhoods. Our results show that neighbourhood composition is not related to peer relationships. Nevertheless, knowledge of safe places suitable for adolescents, as well as the appropriation of unsupervised (hang out) places, correlate with peer relationships. Interestingly, there are divergent results for 7th and 9th graders that can be explained by the developmental stages of the adolescents.

### Keywords

adolescence; belonging; friendship; neighbourhood; peer relationship; spatial appropriation; spatial context

### Issue

This article is part of the issue “On the Role of Space, Place, and Social Networks in Social Participation” edited by Gil Viry (University of Edinburgh), Christoph van Dülmen (Thünen Institute of Rural Studies), Marion Maisonobe (CNRS), and Andreas Klärner (Thünen Institute of Rural Studies).

© 2022 by the author(s); licensee Cogitatio (Lisbon, Portugal). This article is licensed under a Creative Commons Attribution 4.0 International License (CC BY).

### 1. Introduction

Decades of research in sociology, developmental psychology, and education science have produced sizeable and compound knowledge on socialisation in adolescence, youth development, and processes of youth' social inclusion into communities as well as processes of their societal integration. Two main findings that are relevant here are the increasing importance of peer relationships (e.g., Brown & Larson, 2009) and the embeddedness of human development into socio-spatial contexts as claimed by socio-ecological approaches (e.g., Bronfenbrenner & Morris, 1998; Evans, 2007; Melton et al., 2021).

The growing literature on peer relationships shows that during adolescent years, interest in other people beyond the family increases, and friendship and peer

relationships in general gain greater importance and complexity (Allison et al., 1999; Flynn et al., 2017; Larson & Richards, 1991; Melton et al., 2021). Communicating and interacting with peers is important for identity processes (Eder, 1985; Larson & Richards, 1991; Ragelienė, 2016; Swanson et al., 1998) and well-being (Appau et al., 2019; Brown & Larson, 2009; Cuadros & Berger, 2016; Guhn et al., 2013). For instance, literature on well-being discovered joint impacts and interconnectedness of relationships to peers and adults on a wide range of well-being and development indicators, such as (mental) health, resilience, or life satisfaction (e.g., Guhn et al., 2013; Oberle, 2018).

There is growing attention to spatial contexts like neighbourhoods for peer relations that goes beyond the question of whether neighbourhood matters or not (Sharkey & Faber, 2014; White et al., 2021). For example,

Sharkey and Faber (2014) suggest a flexible neighbourhood model that takes different spatial scales, temporal effects, and effect heterogeneities into account. Furthermore, there is a growing policy interest at the municipal level to address spatial inequalities that mean unequal development opportunities for adolescents (not only) in Germany (Petermann et al., 2019). The article contributes to this field by investigating friendship intimacy and peer group belonging as two forms of peer relationships among adolescents. Our primary dataset originates from the 2019 UWE survey (the acronym is for *Umwelt, Wohlbefinden und Entwicklung*, which translates to “environment, well-being, and development”). This is a trend survey monitoring the well-being and development of all adolescents in grades seven and nine in the German cities Herne and Bottrop, which provides information about the neighbourhood the adolescents live in and the attended school.

The contribution of this article to research on the nexus between neighbourhood characteristics and peer relationships is threefold. First, demographic and social compositions of neighbourhoods shape opportunities to establish peer relationships. Second, the spatial context may affect peer relationships as it serves as youth-specific meeting opportunities like youth and community centres, clubs, playgrounds, and hang out places. Hence, we examine the localisation of adolescents’ social worlds in the neighbourhood. Third, in recognising spatial characteristics, we empirically study effect heterogeneity due to the relevance of these characteristics in early and middle adolescence.

## 2. Literature Review

In the following, we briefly summarise the literature on peer relationships during adolescence, covering individual and spatial factors for peer relationship formation. While both kinds of factors are relevant and influential, we draw attention to spatial factors by deriving four hypotheses from the literature, dealing with neighbourhood demography and deprivation, youth-suitable places and spatial appropriation by adolescents.

### 2.1. Peer Relationships in Adolescence

Adolescence is the transitional stage in the life course from childhood to adulthood and is defined primarily as a time of physical, cognitive, social, and emotional changes. This period is usually associated with the teenage years, although there are discussions about extending this stage to 24 when the brain stops developing. However, the empirical analysis of this article focuses on early and middle adolescence, roughly bounded between approximately 11 to 13 years and 14 to 17 years respectively (Salmela-Aro, 2011). Adolescents’ development occurs through relationships (Varga & Zaff, 2018). They interact with larger groups of peers and learn to identify and belong to groups of peers based on simi-

lar characteristics (Eder, 1985). However, recent research has revealed that it is not the number of relationships or the size of a social network that is important to improving positive development, but the quality of relationships, for girls especially (Cuadros & Berger, 2016; Melton et al., 2021). Relying on a very detailed model of adolescent friendships, Flynn et al. (2017) find that high-quality friendships are more likely among young people who are strongly tied in a social network, with regular contacts, more friends, and more mutual support—quantity does correlate with quality.

Compared to early childhood, young people’s peer relationships grow more complex. According to Brown and Larson (2009), we distinguish between friendship intimacy (dyadic friendship) and peer belonging (peer crowd). Dyadic friendship is a question of a confident and intimate relationship while peer crowd is a question of belonging and orientation towards a wider community. Hence, we investigate peer relationships from an ego-centric perspective on social networks. Moreover, we focus on qualitative aspects of relationships within the social networks of adolescents.

Before we address the influence of spatial context, we will briefly summarise some factors that have emerged as significant in previous research. Empathy, defined as the “capacity...to secondarily experience and understand the feelings of another person” (Wölfer et al., 2012, p. 1295), can evolve independently from social integration. It is not clear whether empathy is a precondition of social relationships, but at least it reinforces processes of relationship formation and deepening.

The socio-economic disposition of young people might also influence how they form peer relationships. While it would be bold to assume that economic advantage or disadvantage determines the strength or intimacy of peer relationships, there are different possible paths leading from affluence to peer relationships. There is an obvious connection between affluence and opportunity structure. Concerning socialisation, certain parenting practices (e.g., less direct control and restrictive practices, granting more autonomy, to involve their children in activities in the larger community) are more prevalent among families with higher than lower socioeconomic status (Hoff & Laursen, 2019). The socio-economic disposition could influence peer relationships through school selection, as Garner et al. (2006) report different peer group structures that are present in different schools. In societies like Germany that feature highly stratified school systems, we also find reinforcement of social inequality and segregation through education (Horr, 2016).

It is a quite stable finding that female adolescents feature higher levels of relationship quality and intimacy than males, while the latter tend to have larger networks (Flynn et al., 2017; Helsen et al., 2000; Radmacher & Azmitia, 2006). This may be related to gender roles, e.g., girls are expected to be more prosocial in general and more caring in particular, or to parenting practices, e.g.,

gender heterogeneous monitoring of adolescents (Rose & Rudolph, 2006).

Despite the decreasing range of immediate parental oversight during adolescence, family relations still have an impact on peer interactions (Flynn et al., 2017). There are different arguments on how parent–child relationships influence peer relationships in adolescence. Among others, the compensation argument views peer relationships as a substitute for missing parental social support; the reinforcement argument suggests that healthy parent-child links enable the formation of healthy peer relations, as good parents raise autonomous adolescents (Helsen et al., 2000, pp. 321–322). Compensation would imply that poor family relations go along with good peer relations, while reinforcement predicts the opposite.

Our focus is on young people in grades seven and nine, about the ages of 13 and 15, respectively, in Germany. Both grades are at the secondary education level and there are no school transitions in these grades. Hence, we keep a factor constant that usually would affect peer relations substantially. However, the development of social skills and networks can significantly differ between 7th and 9th graders, as autonomy and the importance of peer relations grow (Allison et al., 1999; Brown & Larson, 2009; Helsen et al., 2000; Stotsky & Bowker, 2018; Swanson et al., 2010).

## 2.2. *The Role of Spatial Contexts*

Whether the spatial context of peer relationships plays a role depends on how strongly these relations are bound to the social contexts of family, school, neighbourhood, and local community according to the ecology of human development (Bronfenbrenner & Morris, 1998; Evans, 2007; Guhn et al., 2013). Most of the time in adolescent life is undoubtedly spent in the first two, family and school (Blanke & Cornelißen, 2005). However, spatial contexts like the neighbourhood or local community are increasingly important during adolescence, because beginning in early adolescence, spatial settings beyond the home are more and more explored and social interactions with people outside the family and school contexts are growing (Allison et al., 1999). In a way, neighbourhoods embody an important market of possibilities to join in common activities (Galster, 2008, p. 12). A neighbourhood is not only a relevant site for several activities but also one of the most important starting points for social contact. In the words of Verbrugge (1977, p. 577), “people whose daily rounds intersect are more likely to become acquaintances than others.” Moreover, this exposure to the neighbourhood and local community is often unsupervised and is undertaken with peers and creates supportive network ties with local people and local organisations (Pretty et al., 1996). Supportive network ties, in the scope of this study, aren’t necessarily positively influencing behaviour or development but are viewed as emotionally close by the adolescents themselves.

Adolescents often spend leisure time near their homes, meaning that unplanned encounters and many more or less regular interactions are located within the limited space of neighbourhoods. The residential environment should be considered an important opportunity context for inter-personal relationships and peer relationships in particular. “Residential context...structures friendship choices,” Welch et al. (2001, p. 5) suggest. Spatial contexts like neighbourhoods offer opportunities for peer encounters that are structured, e.g., by residential segregation and the usage of public space. We distinguish between two aspects of spatial context that influence the formation of social network relationships: neighbourhood-level composition and youth-suitable places in the public sphere.

The demographic and social composition of the neighbourhood is independent of the subjective view and usage of the adolescents but can impede or facilitate processes of peer relationship formation, i.e., to get in touch and meet each other. Demographic composition in terms of a sufficiently large number of peers and residential stability in the neighbourhood may foster peer relationships. It may be easier to find friends and to select adolescents with preferred characteristics as friends if there are many young people around (Blau, 1994). Furthermore, it could be difficult to form high-quality relationships with peers if they are moving away as the development and consolidation of these relations need time. We assume that a high proportion of adolescents among the total population of a neighbourhood and high residential stability offer favourable opportunities for peer relationship formation. Hence, we formulate the neighbourhood demography hypothesis (H1): The more favourable the demographic composition of the neighbourhood, the more likely peer relationships are.

Socially deprived neighbourhoods are critical determinants, particularly for disadvantaged adolescents (Kohen et al., 2008). While neighbourhood characteristics like disadvantaged economic conditions negatively affect a wide range of youth outcomes such as school achievement and emotional and behavioural problems (Leventhal & Brooks-Gunn, 2000), there is little knowledge about neighbourhood effects on peer relationships. One possible outcome might be a uniting effect that leads to the formation of close friendships to support coping in adverse circumstances. However, we assume that deprived neighbourhoods create a climate of mistrust, withdrawal, and low enforcement of social norms, making it difficult to establish confident peer relationships. Hence, we assume the neighbourhood deprivation hypothesis (H2): The lower the social deprivation of the neighbourhood, the more likely peer relationships are.

Feld’s (1981) focus theory states that contact and social relationship is often an unintended consequence of everyday activities within joined foci like encountering in public spaces or being at the same site (sites of recreation, youth-suitable places, etc.). Youth-suitable

places in the public sphere are needed to spend free time with peers in different activities. Our research is concerned with such foci places in the neighbourhood. Managing their leisure time and finding the time to connect with peers outside of school and organised afternoon activities has become increasingly challenging, as living environments and leisure time schedules are more diverse and individual than they have been in the past (Harring et al., 2010, pp. 11–12). It is, however, an important step to explore one's own identity and social roles. Unfortunately, adolescents face a dilemma when it comes to spatial appropriation. They usually are unwanted in the adult world, because of the unpredictability and immaturity of their behaviour, because they are loud and sometimes destructive, non-adult, and deviant (Gestring & Neumann, 2007, p. 138; Wehmeyer, 2013, p. 11). Whitlock (2007) found that the available opportunities for creative engagement like group involvement are directly related to youth development of connectedness to community. One of these rare opportunities is the shopping mall, the (stereotypical) "natural habitat" of youths and adolescents. The shopping mall holds a wide range of qualities valued by young people (see Gestring & Neumann, 2007): While protected from the weather and being watched by security infrastructure, there is no physical harm to be expected in the mall. In the streets, for instance, there is a chance to be mugged or physically victimised by other youths—something that is usually prevented by security personnel. Secondly, malls are designed to be pleasant places to spend time. There are benches, fountains, restrooms, and all kinds of comfortable infrastructure for public use. Not least, the mall represents an opportunity to meet with friends, the clique, or potential romantic partners. In short, it hosts all commonalities of common places while being exceptionally appealing to those seeking consumption and social exchange.

However, adolescents can be found in other public spaces as well, despite being regularly frowned upon. Together, places assigned to youths and adolescents as well as places they regularly seek out voluntarily are what we call youth-suitable places in the following. Consequently, we argue that the knowledge, as well as spatial appropriation of youth-suitable places, facilitates the social integration of adolescents. Finally, we derive two related hypotheses. Neighbourhood places hypothesis (H3): When adolescents know youth-suitable places in their neighbourhoods, peer relationships are more likely. Spatial appropriation hypothesis (H4): When adolescents use youth-suitable places, peer relationships are more likely.

Research in different areas of adolescent life and development, such as subjective well-being (Knüttel et al., 2021), educational outcomes (Horr, 2016), or delinquency (Oberwittler, 2010), consistently found that spatial effects, particularly related to the neighbourhood level are, compared to individual factors, of minor importance. Yet, Sellström and Bremberg (2006) observe

that up to 10% of the variation in child behavioural outcomes may be explained by neighbourhood level qualities. Moreover, extensive research on neighbourhood contexts concerning the adjustment of adolescents derives mostly from North American studies of disadvantaged neighbourhoods (Kohen et al., 2008; Sharkey & Faber, 2014), while less is known about neighbourhood effects in other parts of the world, where the urban concentration of disadvantage is not so pronounced as in the US.

### 3. Data and Analysis

The data source for the following descriptions and analyses is the 2019 UWE survey (UWE, 2019). The UWE study is an adaption of the Canadian "middle years development instrument" (Schonert-Reichl et al., 2013), but was developed further and tested to fit the German context. It has a whole-child subjective well-being approach (see Moore, 2020, p. 724) and seeks to understand the respective impact of social environments and relationships with peers and adults. This multi-topic survey asks about social and emotional development, school experiences, social relationships, leisure behaviour, health and socio-demographics, and includes variables on school and small area contexts.

The survey itself was conducted using questionnaires that were handed out by interviewers in 23 schools at the secondary education level in the two German cities of Herne and Bottrop. They are mid-sized cities with more than 100 thousand inhabitants and are part of the Ruhr area, Germany's largest urban area. Both are struggling with child poverty, relatively high numbers of school dropouts and decreasing population. The spread of socio-economic hardship among the population means that the social structure is rather homogeneous. That is, *inter alia*, why they were chosen for the project. The inferential population consisted of 4788 eligible students in grades seven and nine. Of this group, 3225 youths took part in the survey, resulting in a response rate of 68% (Schwabe et al., 2021). The theoretical framework of the study and further analysis of subjective well-being can be found in Knüttel et al. (2021). The study is also relevant for policy research. Reports to the participating schools, as well as to the two cities involved, were published to derive measures to ensure and improve the well-being of the youth.

#### 3.1. Peer Relationship Variables

The two dependent variables are measures of peer relationship quality. The first variable is related to the quality of dyadic peer relationships and is operationalised by a scale that combines three items on friendship intimacy: (a) "I have at least one really good friend I can talk to when something is bothering me," (b) "I have a friend I can tell anything," and (c) "there is somebody my age who really understands me." We measured agreement

to these items on a five-point Likert scale. The second dependent variable is related to the quality of belonging to peers, though not necessarily a clique. Again, the variable is a scale that combines three items on peer belonging measured on a five-point scale: (a) “I feel part of a group of friends that do things together;” (b) “I feel that I usually fit in with other kids around me;” and (c) “when I am with other kids my age, I feel I belong.” At least two of them must have been answered, which is the case for 99% of our respondents. Both variables are reliable in terms of internal consistency: Cronbach’s alpha for friendship intimacy is 0.75 and 0.81 for peer belonging. Unfortunately, the additive scores are heavily skewed towards strong agreement because almost all adolescents have best friends and belong to a peer crowd. Thus, we decided to dichotomise the scales separating respondents agreeing much on all three items of the respective scale from respondents with any other answer combination (the cut-off point is 4.5 on the five-point scale). Of our respondents, 69% scored high on friendship intimacy and 47% on peer belonging (see Table 1 for summary statistics of all variables).

### 3.2. Neighbourhood Level Characteristics

In the scope of this article, a neighbourhood is one of 30 administrative units in both cities. These are defined by federal and local statistical offices and reflect historical as well as administrative boundaries. The neighbourhoods’ populations and spatial dimensions range from 1,479 to 23,600 inhabitants and 0.66 to 25.47 km<sup>2</sup> respectively. Statistical data at the neighbourhood level was accessed from open data portals of Herne (<https://opendata.herne.de>) and Bottrop (<https://www.offenesdatenportal.de/organization/stadt-bottrop>).

We employ two indicators for the demographic composition at the neighbourhood level. First, we measure the density of the population under the age of 15 per square kilometre accounting for the number of peers to potentially socialise with. Second, residential stability is operationalised by the residential turnover rate, which describes the share of the population that is replaced due to migration in 2018:

$$\text{residential turnover rate}_{n2018} = \frac{\max(\text{vol. of immigration}_{n2018}, \text{vol. of emmigration}_{n2018})}{\text{mean}(\text{population}_{n2018}, \text{population}_{n2017})}$$

**Table 1.** Summary statistics of all variables.

variable	min	max	mean	standard deviation	n
<i>peer relationship</i>					
friendship intimacy	0	1	0.691		3175
peer belonging	0	1	0.471		3176
<i>neighbourhood level characteristics</i>					
density of u15 population per km <sup>2</sup>	6.56	1207.69	371.33	270.58	30
residential turnover rate	2.28	4.19	3.19	0.58	30
prop. u15 in social benefit households in u15 population	1.8	50.5	23.59	10.90	30
<i>neighbourhood places and spatial appropriation</i>					
places that provide youth services	0	1	0.583		3126
safe places to hang out	0	1	0.767		3121
at outdoor places at least once a week	0	1	0.430		3082
at hangout places at least once a week	0	1	0.437		3096
<i>control variables</i>					
Herne (ref: Bottrop)	0	1	0.544		3217
male	0	1	0.497		3181
migration background	0	1	0.464		3191
single parent	0	1	0.149		3170
single child	0	1	0.256		3168
financial capacities of the household	1	4	3.20	0.55	3160
empathy	1	5	3.93	0.79	3189
quality of relationships with adults at home	1	4	2.32	0.97	3019
secondary school	0	1	0.343		3217
comprehensive school	0	1	0.273		3217
academic secondary school	0	1	0.384		3217
9th grade (ref: 7th grade)	0	1	0.532		3217

*Volume of immigration and emigration* specify the total volume of population movement from 1 January to 31 December. The key date for *population* is 31 December. Social deprivation at the neighbourhood level is measured by the proportion of the population under 15 living in social benefit households out of the total population under 15. *n* stands for neighbourhood.

### 3.3. Neighbourhood Places and Spatial Appropriation

Respondents were asked about their knowledge of places suitable for young people in the neighbourhood. We use their responses to the questions about whether they know of safe places in their neighbourhood to meet their friends and places in their neighbourhood with offers for young people. We use them as dummy variables, where the answers “no” and “I don’t know” are combined as not knowing these places.

In addition, spatial appropriation is operationalised by two items about places where respondents usually go after school: how often they visit parks, playgrounds and sports fields, and how often they hang around in public, e.g., in shopping malls. Respondents told us how many days they did so, but as both variables are heavily skewed, we dichotomised them to differentiate between no usage at all and at least once a week.

### 3.4. Control Variables

Individual variables like empathy, socio-economic disposition, gender, and family characteristics that had been influential to peer relations in previous research are included to test the effect stability of our central spatial characteristics. We operationalised empathy as a reliable additive score of three items. Since it is very unlikely that adolescents know their families’ income, we operationalised the financial capacities of the household by a reliable additive score of three items: (a) “my family can afford many things,” (b) “I can do many things with my friends that cost money,” and (c) “my family often has to save money”—all were measured on a four-point scale of agreement that has been used in different surveys (Andresen et al., 2019; Schräpler et al., 2020). We included variables for single-parent households, single-child families, and a measure for the quality of relationships with adults at home as proxy measures of family influence, which has been acknowledged as influential for peer relationships in previous research (see an overview in Brown & Larson, 2009, p. 98). The variable *quality of relationships with adults at home* consists of four items measured on a four-point scale. Respondents rated how much they agreed with having a parent or another adult in their home (a) “who believes that I will be successful,” (b) “who listens to me when I have something to say,” (c) “to whom I can talk about my problems,” and (d) “to whom I am really important.”

A migration background is defined as being born in another country or having at least one parent who

was born outside of Germany. There was some uncertainty in the data, as many respondents did not provide information on these questions. Item non-responses are replaced as having a migration background if respondents reported speaking languages other than German or English at home.

Furthermore, the German school system is highly stratified and different types of schools tend to attract students from certain social classes. We include the type of school our respondents attend and differentiate between three types: secondary, comprehensive, and academic secondary. We included a dummy variable to distinguish the cities of Herne and Bottrop.

### 3.5. Analysis

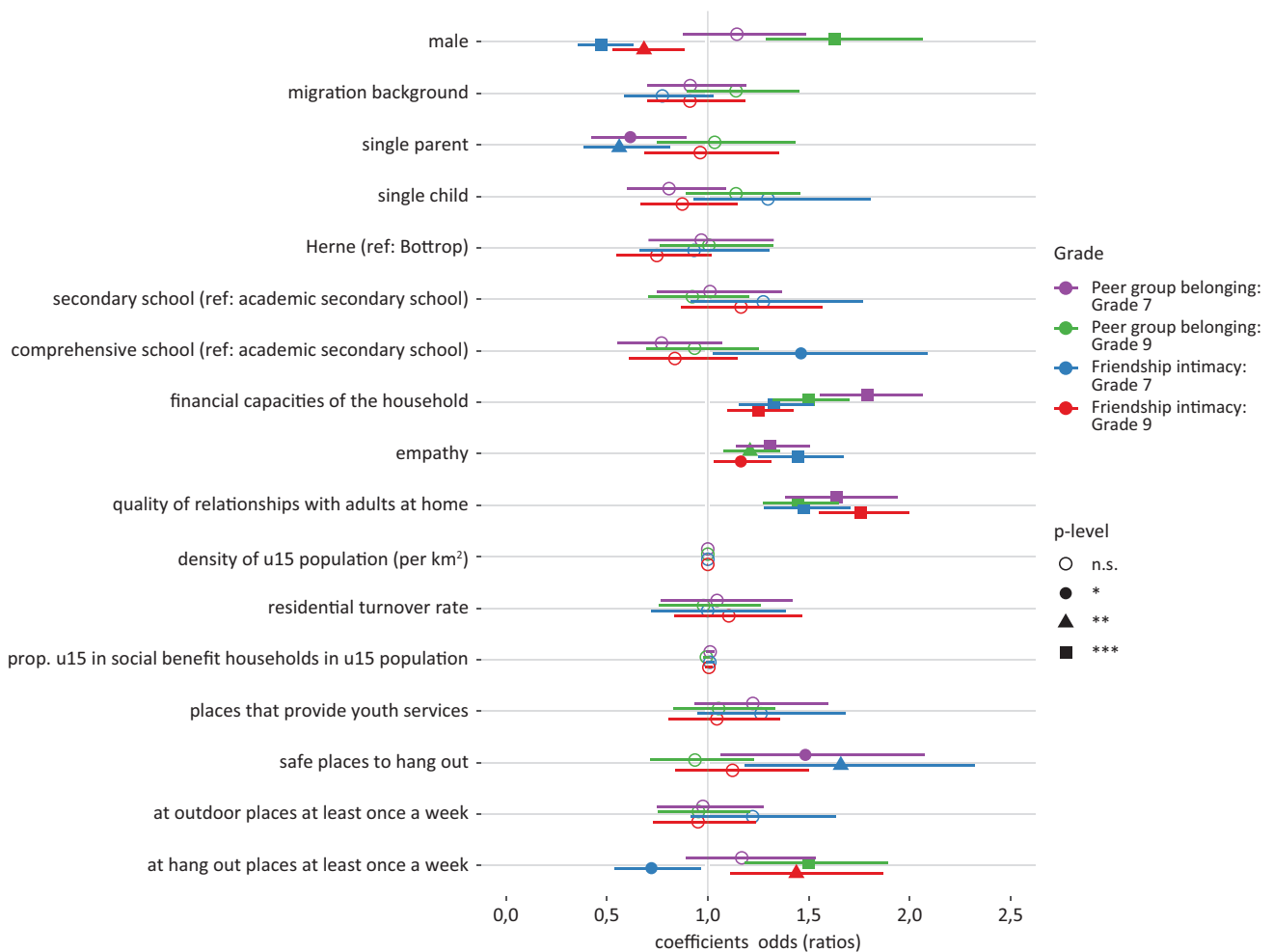
We conducted the analysis using multilevel logistic regression models with R 4.1.2 (R Core Team, 2021) and the lme4-package (Bates et al., 2015). To investigate heterogeneous effects depending on different stages in adolescence, we will present separate models for 7th and 9th graders (seventh graders have a median and mode age of 13 and 98% are between 12 and 14 years old. Ninth graders have a median and mode age of 15 and 96% and are between 14 and 16 years old). For each grade and dependent variable, we fitted a series of four models (see Tables 2 and 3 in the Supplementary File):

- Null model 1: no independent variables, just to decompose multilevel variances
- Basic model 2: just control variables
- Context model 3: additional neighbourhood level characteristics
- Final model 4: additional neighbourhood place and spatial appropriation

## 4. Results

Figure 1 compares the effect sizes of all final models. Neither peer belonging nor friendship intimacy has substantial neighbourhood level variation (see Tables 2 and 3 in the Supplementary File). Therefore, no relevant impact of neighbourhood level characteristics can be identified. Moreover, the values of the Akaike Information Criterion (AIC) show that adding context variables is not preferable at all.

Despite the lack of impact of demographic and social compositions at the neighbourhood level, some neighbourhood effects depend on the individual knowledge and appropriation of public space. They differ for age groups and outcomes: Knowing safe places in the neighbourhood to hang out with friends is important for the 7th graders but irrelevant for 9th graders. For 9th graders, hanging out, e.g., at malls, seems to be much more important for their peer relations than knowledge of safe places. In contrast, spending time at such hangout places is related to lower values for friendship intimacy among the 7th graders. The period between 7th and 9th grade



**Figure 1.** Effect sizes of final models.

seems to be one of transition, where adolescents gain the autonomy that is necessary to form relationships with peers independently. Spatial independence and the appropriation of public spaces increase from early to middle adolescence.

Consistent with previous findings for other outcomes, neighbourhood effect sizes on peer relationships are small compared to effects at the individual level. Male adolescents have significantly lower values for friendship intimacy in both age groups. For peer belonging, the gender pattern is reversed, but only the coefficient for the 9th graders is significant. While girls are more likely to form close relationships with peers as previous studies suggest, boys have a stronger sense of belonging. The number of adults in the household is especially relevant for early adolescence. Once again, the differences between the grades illustrate the growing independence from the nearby environment in the process of growing up.

Three effects are consistent for both dependent dimensions and both age groups: financial capacity of the household, empathy, and quality of relationships with adults at home—all positively affect friendship intimacy and peer belonging. Adolescents rating their economic

background higher also report better peer relationships, *ceteris paribus*. This effect—of financial capacities of the households—points to the core of social and political concerns: Economic inequality and its consequences are already present in adolescence. Empathy is positively correlated with both dependent variables, suggesting that it reinforces processes of relationship formation and deepening indeed. The positive effect of quality of relationships with adults at home supports the reinforcement argument and contradicts the compensation argument.

## 5. Discussion

The purpose of this contribution is to (a) evaluate the relationship between neighbourhood characteristics, including constructs for adolescents' perceptions of youth-suitable places in the neighbourhood and the time spent in such places as well as demographic and social qualities of neighbourhoods and the qualitative aspects of peer relations (intimacy and belonging) and (b) identify effect heterogeneity of neighbourhood characteristics between different grades.

We developed two hypotheses on the demographic and social compositions at the neighbourhood level.

We cannot report significant effects of neighbourhood level characteristics on any of our dependent variables, i.e., friendship intimacy and peer belonging. Neither demographic opportunities measured by population density and residential stability (H1) nor social deprivation measured by social welfare recipients impact the quality of peer relationships (H2). There might be several reasons for these empirical findings. Demographic and social compositions of neighbourhoods might influence the formation of relational ties rather than the qualitative aspects of relationships like intimacy, strength and feelings of belonging. Verbrugge (1977, p. 577) explains friendship processes and hence peer relationship formation as a two-stage development of meeting and mating. Meeting as getting in touch with other peers is more opportunity-driven while mating as selecting in-depth friends is more preference driven. Neighbourhood compositions might affect the meeting aspect of peer formation much more than the qualitative mating aspect. In addition, the effects of demographic compositions might not be linear (Quercia & Galster, 2000; Sharkey & Faber, 2014). Once a certain threshold of favourable demographic compositions is reached, more dense and more residentially stable neighbourhoods are ineffective. This might be particularly true for urban settings. There might be threshold effects for social deprivation as well, but the argument would be that the researched German cities have moderate levels of social segregation compared to cities in the US. Both researched cities slightly differ in the observed characteristics and are generally considered to be on the lower end of social stratification and are comparably homogenous in that sense. They don't reach the relevant threshold of social deprivation that significantly turns processes of confident peer relationships. Data from different and more heterogeneous areas might yield different results.

Another hypothesis was formulated on the influence of youth-suitable places in the adolescent's neighbourhood (H3). We see the hypothesis confirmed, but with a limited scope. While it is irrelevant whether adolescents know places with age-appropriate offers, knowing safe places to hang out increases relationships among peers. However, this only applies to 7th graders. We would argue that outdoor places like parks, playgrounds and sports fields are relevant for spending leisure time with peers but aren't relevant for peer relationships. Only when these places are assessed as safe are they of importance for peer relations. That such safe places for close friendships and peer belonging are only significant for 7th graders is probably due to the influence of parents, who see 7th graders as more vulnerable in unsafe places than 9th graders.

Finally, we hypothesised how regularly spending leisure time in places suitable for young people promotes peer relationships (H4). This hypothesis is confirmed, albeit with limitations. Even if adolescents regularly spend time at outdoor places such as parks, playgrounds and sports fields, they do not have high-quality peer

relationships because of it. In contrast, time spent regularly in places to hang out proves to be influential. While for 9th graders both friendship intimacy and peer belonging are strongly promoted, for 7th graders friendship intimacy is weakened when they regularly spend time in such places. We suspect that these correlations are strongly related to adolescent development. For 9th graders, hanging out and being unsupervised in outdoor places seems not only to be part of "normal" development but an essential part of their lives and fostering social relationships. For 7th graders, on the other hand, this is not yet true. Unsupervised spending of free time at this stage of development is probably still too early and rather detrimental for their social relationships.

This article examines the neighbourhood influences on adolescents' peer relationships. Other influences were covered by control variables as much as possible. Here, the findings put forth by previous research are confirmed: Boys feel a stronger sense of belonging to peer groups and girls are more likely to maintain intimate friendships; empathy and sound, close parental relationships, as well as the financial capacities of the parental household, promote peer relationships, while single-parent households limit the peer relationships of 7th graders. We are thus confident that we have meaningfully expanded the state of research on adolescent peer relationships to include the spatial aspects of the neighbourhood.

However, there are some limitations to our research. First, by looking at the quality of peer relationships (intimacy and belonging), we focused on the social inclusion of young people but neglected the social structure of relationships and networks and the conflicts within them. Secondly, we looked at the spatial context of peer relationships, especially the neighbourhood composition and the respondent's knowledge and social appropriation of youth-relevant places. We did not investigate the neighbourhood composition of peers or processes of spatial appropriation by adolescents or spatial barriers. Nor did we examine the spatial complexity of friendship formation processes. Thirdly, we have analysed cross-sectional data and can thus only prove correlations, not causalities. We were also unable to examine possible self-selections into specific neighbourhoods, but we assume that it is not the adolescents but their parents who are subject to self-selections. Further research may want to shed more light on the network structure (e.g., egocentric networks on emotional and instrumental support), spatial complexities (e.g., conducting egohoods and measuring spatial distances by GPS data), and underlying mechanisms as well as causality and self-selection issues (e.g., collecting longitudinal survey data and using more complex approaches, like SEM).

#### Acknowledgments

We would like to thank Melina Lau in particular for her initial contributions, as well as all ZEFIR researchers, municipalities, and schools involved in the UWE project.



## Conflict of Interests

The authors declare no conflict of interests.

## Supplementary Material

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

## References

- Allison, K. W., Burton, L., Marshall, S., Perez-Febles, A., Yarrington, J., Kirsh, L. B., & Merriwether-DeVries, C. (1999). Life experiences among urban adolescents: Examining the role of context. *Child Development, 70*, 1017–1029.
- Andresen, S., Wilmes, J., & Möller, R. (2019). *Children's Worlds+: Eine Studie zu Bedarfen von Kindern und Jugendlichen in Deutschland* [Children's Worlds+: A study on needs of children and adolescents in Germany]. Bertelsmann Stiftung.
- Appau, S., Churchill, S. A., & Farrell, L. (2019). Social integration and subjective wellbeing. *Applied Economics, 51*(16), 1748–1761.
- Bates, D., Maechler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software, 67*(1), 1–48.
- Blanke, K., & Cornelißen, W. (2005). German adolescents time use from 1991 to 2001: Is gender symmetry in sight? *Society and Leisure, 2*, 11–30.
- Blau, P. M. (1994). *Structural contexts of opportunities*. University of Chicago Press.
- Bronfenbrenner, U., & Morris, P. A. (1998). The ecology of developmental processes. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology: Theoretical models of human development* (pp. 993–1028). Wiley.
- Brown, B., & Larson, J. (2009). Peer relationships in adolescence. In R. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (pp. 74–103). Wiley.
- Cuadros, O., & Berger, C. (2016). The protective role of friendship quality on the wellbeing of adolescents victimized by peers. *Youth Adolescence, 45*, 1877–1888.
- Eder, D. (1985). The cycle of popularity: Interpersonal relations among female adolescence. *Sociology of Education, 58*(3), 154–165.
- Evans, S. D. (2007). Youth sense of community: Voice and power in community contexts. *Journal of Community Psychology, 35*, 693–709.
- Feld, S. L. (1981). The focused organization of social ties. *American Journal of Sociology, 86*, 1015–1035.
- Flynn, H. K., Felmlee, D. H., & Conger, R. D. (2017). The social context of adolescent friendships: Parents, peers, and romantic partners. *Youth & Society, 49*(5), 679–705.
- Galster, G. C. (2008). Quantifying the effect of neighbourhood on individuals: Challenges, alternative approaches, and promising directions. *Schmollers Jahrbuch, 128*(1), 7–48.
- Garner, R., Bootcheck, J., Lorr, M., & Rauch, K. (2006). The adolescent society revisited: Cultures, crowds, climates, and status structures in seven secondary schools. *Journal of Youth and Adolescence, 35*, 1023–1035.
- Gestring, N., & Neumann, U. (2007). Von Mall Rats und Mall Bunnies: Jugendliche in Shopping Malls [About mall rats and mall bunnies: Adolescents in shopping malls]. In J. Wehrheim (Ed.), *Shopping malls* (pp. 135–152). Springer.
- Guhn, M., Schonert-Reichl, K. A., Gadermann, A. M., & Hymel, S. (2013). A population study of victimization, relationships, and well-being in middle childhood. *Journal of Happiness Studies, 14*, 1529–1541.
- Harring, M., Böhm-Kasper, O., Rohlf, C., & Palentien, C. (2010). Peers als Bildungs- und Sozialisationsinstanzen—Eine Einführung in die Thematik [Peers as instances of education and socialisation: An introduction to the topic]. In M. Harring, O. Böhm-Kasper, C. Rohlf, & C. Palentien (Eds.), *Freundschaften, Cliques und Jugendkulturen. Peers als Sozialisations- und Bildungsinstanzen* [Friendships, cliques and youth culture. Peers as instances of education and socialisation] (pp. 9–19). Springer.
- Helsen, M., Vollebergh, W., & Meeus, W. (2000). Social support from parents and friends and emotional problems in adolescence. *Journal of Youth and Adolescence, 29*, 319–335.
- Hoff, E., & Laursen, B. (2019). Socioeconomic status and parenting. In M. H. Bornstein (Ed.), *Handbook of parenting: Biology and ecology of parenting* (pp. 421–447). Routledge.
- Horr, A. (2016). Nachbarschaftseffekte [Neighbourhood effects]. In C. Diehl, C. Hunkler, & C. Kristen (Eds.), *Ethnische Ungleichheiten im Bildungsverlauf* [Ethnic inequality in educational trajectories] (pp. 397–430). Springer.
- Knüttel, K., Stefes, T., Albrecht, M., Schwabe, K., Gaffron, V., & Petermann, S. (2021). *Wie geht's Dir? Ungleiche Voraussetzungen für das subjektive Wohlbefinden von Kindern in Familie, Schule und Stadtteil* [How are you? Unequal requirements for subjective well-being of children in family, school, and neighbourhood]. Bertelsmann Stiftung; ZEFIR.
- Kohen, E. D., Leventhal, T., Dahinten, V. S., & McIntosh, C. N. (2008). Neighborhood disadvantage: Pathways of effects for young children. *Child Development, 79*, 156–169.
- Larson, R., & Richards, M. (1991). Daily companionship in late childhood and early adolescence: Changing developmental contexts. *Child Development, 62*(2), 284–300.
- Leventhal, T., & Brooks-Gunn, J. (2000). The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes. *Psychological Bulletin, 126*, 309–337.
- Melton, T. N., Brehm, M. V., & Deutsch, N. L. (2021).

- Broadening the perspective on youth's systems of support: An ecological examination of supportive peer and adult relationships during adolescence. *Journal of Community Psychology*, 49, 1334–1357.
- Moore, K. A. (2020). Developing an indicator system to measure child well-being: Lessons learned over time. *Child Indicators Research*, 13(2), 729–739.
- Oberle, E. (2018). Early adolescents' emotional well-being in the classroom: The role of personal and contextual assets. *Journal of School Health*, 88(2), 101–111.
- Oberwittler, D. (2010). Jugendkriminalität in sozialen Kontexten—Zur Rolle von Wohngebieten und Schulen bei der Verstärkung von abweichendem Verhalten Jugendlicher [Youth crime in social contexts: About the role of living areas and schools on the reinforcement of deviant behaviour of adolescents]. In B. Dollinger & H. Schmidt-Semisch (Eds.), *Handbuch Jugendkriminalität* [Handbook of juvenile delinquency] (pp. 213–227). Springer.
- Petermann, S., Strohmeier, K. P., & Yaltzis, K. (2019). Kleinräumige Kontexte des Wohlbefindens von Kindern und Jugendlichen. Integrierende Stadtentwicklung mit dem kommunalen Monitoring-Instrument UWE [Small-scale contexts of well-being of children and adolescents: Integrative city development with the local monitoring instrument UWE]. *Raumforschung und Raumordnung*, 77(4), 383–400.
- Pretty, G. M. H., Conroy, C., Dugay, J., Fowler, K., & Williams, D. (1996). Sense of community and its relevance to adolescents of all ages. *Journal of Community Psychology*, 24, 365–379.
- Quercia, R. G., & Galster, G. C. (2000). Threshold effects and neighborhood change. *Journal of Planning Education and Research*, 20(2), 146–162.
- R Core Team. (2021). *R: A language and environment for statistical computing*. <https://www.R-project.org>
- Radmacher, K., & Azmitia, M. (2006). Are there gendered pathways to intimacy in early adolescents' and emerging adults' friendships? *Journal of Adolescent Research*, 21, 415–448.
- Ragelienė, T. (2016). Links of adolescents identity development and relationship with peers: A systematic literature review. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, 25(2), 97–105.
- Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin*, 132(1), 98–131.
- Salmela-Aro, K. (2011). Stages of adolescence. In B. B. Brown & M. J. Prinstein (Eds.), *Encyclopedia of adolescence* (pp. 360–368). Academic Press.
- Schonert-Reichl, K. A., Guhn, M., Gadermann, A. M., Hymel, S., Sweiss, L., & Hertzman, C. (2013). Development and validation of the middle years development instrument (MDI): Assessing children's well-being and assets across multiple contexts. *Social Indicators Research*, 114(2), 345–369.
- Schräpler, J.-P., Lehmkuhl, D., Farwick, A., Petermann, S., & Schmitt, J. (2020). *Leben an der "Neuen Emscher"—Analyse des sozialen Wandels der Bezirke entlang der Emscher* [Life on the "New Emscher": Analysis of the social change in areas along the Emscher]. ZEFIR.
- Schwabe, K., Albrecht, M., Stefes, T., & Petermann, S. (2021). *Konzeption und Durchführung der UWE-Befragung 2019* [Concept and implementation of the UWE survey 2019]. ZEFIR.
- Sellström, E., & Bremberg, S. (2006). The significance of neighborhood context to child and adolescent health and well-being: A systematic review of multilevel studies. *Scandinavian Journal of Public Health*, 34, 544–554.
- Sharkey, P., & Faber, J. F. (2014). Where, when, why, and for whom do residential contexts matter? Moving away from the dichotomous understanding of neighborhood effects. *Annual Review of Sociology*, 40(1), 559–579.
- Stotsky, M., & Bowker, J. (2018). An examination of reciprocal associations between social preference, popularity, and friendship during early adolescence. *Journal of Youth and Adolescence*, 47, 1830–1841.
- Swanson, D. P., Edwards, M. C., & Spencer, M. B. (2010). *Adolescence: Development during a global era*. Elsevier Academic Press.
- Swanson, D. P., Spencer, M. B., & Petersen, A. (1998). Identity formation in adolescence. In K. Borman & B. Schneider (Eds.), *The adolescent years—Social influences and educational challenges: Ninety-seventh yearbook of the National Society for the Study of Education, part 1* (pp. 18–41). The National Society for the Study of Education.
- UWE. (2019). *Umwelt, Wohlbefinden und Entwicklung von Kindern und Jugendlichen (UWE) Befragung 2019* [Environment, well-being, and development of children and youths (UWE) survey 2019]. <https://doi.org/10.7802/2350>
- Varga, S., & Zaff, J. (2018). Webs of support: An integrative framework of relationships, social networks, and social support for positive youth development. *Adolescent Research Review*, 3, 1–11.
- Verbrugge, L. M. (1977). The structure of adult friendship choices. *Social Forces*, 56, 576–597.
- Wehmeyer, K. (2013). *Aneignung von Sozial-Raum in Kleinstädten: Öffentliche Räume und informelle Treffpunkte aus der Sicht junger Menschen* [Appropriation of social space in small towns: Public space and informal meeting sites from the viewpoint of young people]. Springer.
- Welch, S., Sigelman, L., Bledsoe, T., & Combs, M. (2001). *Race and place. Race relations in an American city*. Cambridge University Press.
- White, R. M., Witherspoon, D. P., Wei, W., Zhao, C., Pasco, M. C., Maereg, T. M., & Winkler, E. (2021). Adolescent development in context: A decade review of neighborhood and activity space research. *Journal*

of *Research on Adolescence*, 31(4), 944–965.  
Whitlock, J. (2007). The role of adults, public space, and power in adolescent community connectedness. *Journal of Community Psychology*, 35, 499–518.

Wölfer, R., Cortina, K. S., & Baumert, J. (2012). Embeddedness and empathy: How the social network shapes adolescents' social understanding. *Journal of Adolescence*, 35(5), 1295–1305.

### About the Authors



**Mats Beckmann** (B.A.) is a third-year graduate student in social science at Ruhr-Universität Bochum. He majors in the study program Methods in Empirical Social Science. Until November 2021 he was employed at ZEFIR as a research assistant. He specializes in quantitative methods, spatial analysis, and data visualization. His main interests concern social disparities in education and participation in the labour market.



**Katharina Knüttel** graduated in social sciences (Diploma) at the Ruhr-Universität Bochum. After several years of teaching statistics for social scientists she began to work as a researcher at the center of interdisciplinary regional studies (ZEFIR) in Bochum. Her main interests are regional (social) disparities, social segregation in cities, neighbourhood effects on child and youth development as well as political strategies to deal with such phenomena.



**Sören Petermann** has been a professor of sociology, in particular urban and regional sociology, at Ruhr-Universität Bochum since 2016. His research interests concern the effects of socio-spatial contextual conditions on social well-being and social coexistence, in particular trust-based exchange in personal networks and the causes and effects of this form of social capital. He also deals with questions of urban segregation processes, everyday mobility and voluntary work of adolescents.



**Till Stefes** (M.A.) is a sociology graduate from the University of Mannheim, former research fellow at ZEFIR, Bochum, and now research fellow at Ruhr-Universität Bochum with the Faculty of Social Science. At ZEFIR he was responsible for conducting the UWE project and he is co-author of the respective field-reports. His research primarily focuses on the field of family sociology and sociology of youth. Recent publications also covered the subject of educational research.