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## From the President

Dear EARA members,

In this letter I would like to inform you about some recent EARA developments, mostly focusing on publications and meetings.

The Special issue in the Journal of Adolescence based on the 2018 EARA Ghent conference papers is making good progress. The focus of the special issue will be on Resilience in Adolescence: Definitions, theory, and challenges. Ingrid Schoon and Frosso-Stefanidi-Motti will serve as content editors and Wim Beyers as process editor. The call for applications has been closed and submissions are currently being prepared. Moreover, during the last months a very interesting new volume in the Studies in Adolescent Development series has been published. This series is published by Routledge in conjunction with EARA, and edited by Lauree Tilton-Weaver and myself on behalf of EARA. The new book is titled Psychosocial Development in Adolescence: Insights the Dynamic from *Systems Approach* and is edited by Saskia Kunnen, Naomi de Ruiter, Bertus Jeronimus, and Mandy van der Gaag. Should you be interested in editing or writing a book in the SIAD series, feel free to contact the series editors.

Preparations for the next EADP-EARA-SRA Summer School are also going well. In cooperation with our sister organizations European Association for Developmental Psychology (EADP) and the Society for Research on Adolescence (SRA), we agreed to increase the length of the school to four days. The summer school will be held from August 26 to 29, just before the ECDP2019 conference. With the assistance of Spyridon Tantaros, organizer of the ECDP2019 conference, a beautiful location for the summer school has been found in Kalamáta, a nice town of the Peloponnese peninsula in Greece. The summer schools are known for their intensity and hard work, but the many opportunities to relax in this year's location might make that a challenge. We were able to include excellent Senior Scholars. This year, Rob Crosnoe, Linda Juang, Tina Malti, Katariina Salmela-Aro, Michiel Westenberg, and Ellen Hamaker will participate. I would like to thank them already for their investments in making the school a success. The call for applications has just been closed and currently the organizing committee, consisting of Katariina Salmela-Aro, Lisa Kiang and myself, is busy with the selection of participants. Those who applied can expect news before the end of May!

There is also some news from the International Consortium of Developmental Science Societies (ICDSS). A new governance structure is being developed, in which each member association will have one representative. Also, in addition to international research collaborations and management tools, ICDSS is exploring other contributions to its member associations.

Last, preparations for the 2020 conference in Porto are well underway. Paula Mena Matos and her team are working hard to prepare the logistics as well as an interesting and inspiring content. I am also pleased to let you know some of our members are preparing bids for the 2022 and 2024 conferences, both in the north and south of Europe, so it looks like we have beautiful

locations to go to in the next couple of years! Stay tuned....

I wish you an inspiring and productive summer season,

Susan Branje EARA President Utrecht University, The Netherlands

# Research on Adolescence from The Netherlands

**Submitted by Caspar J. van Lissa** (Utrecht University, The Netherlands)

1. Parenting in Times of War: A Meta-Analysis and Qualitative Synthesis of War-Exposure, Parenting, and Child Adjustment

<u>Hend Eltanamly, Patty Leijten,</u> <u>Suzanne Jak, and Geertjan Overbeek</u> (University of Amsterdam, The Netherlands)

#### Background

Growing up in times of war is a fact many children and adolescents are experiencing on a daily basis. The negative effects of war exposure on children have been intensively studied, yet we do not know how war exposure casts its adverse effects on children. One possible way this could be occurring is through parenting practices. Increased parenting stress and parental mental health problems, as consequences of living in war conditions, might compromise parents' ability to attend to their children's emotional needs. For example, mental health problems may make parents become irritable and view normal parenting as highly stressful. So when parents suffer from mental health problems, and also need to constantly focus on keeping their children alive, they might have less time and mental space to take care of their children's emotional needs, which could lead to children's maladjustment.

While it is generally understood that war exposure casts multiple negative effects on adults and children, it would be reductionist to view families in the war context as responding similarly to trauma. People can be capable of great resilience, and it is not inconceivable that exposure to war might, paradoxically, activate some elements of strength and resilience, at least in some families. For example, families who have been exposed to some form of extreme adversity, such as almost losing a family member, might become more sensitive towards their children, displaying more warmth and support. Therefore, while there is evidence to believe that more war exposure is likely to be associated with adverse parenting practices we have reasons to doubt whether this is the general pattern for all war-exposed families.

#### **Methods**

Quantitative Strand. By using a metastructural equation model analytic (MASEM), we examined whether the effects of war exposure on children's adjustment can partly be explained through parenting practices. We included studies on children in early, middle, late childhood, adolescence. Our search process vielded 38 quantitative publications with data on 54,372 participants (M age = 12.00, SD age = 3.54). We extracted correlations between (1) war-exposure; (2) measures of parenting (parental warmth, behavioral control, and harshness); and (3) measures of child (post-traumatic adjustment stress symptoms, depression and anxiety, social externalizing problems, problems, positive outcomes).

Qualitative Strand. By using a grounded theory approach, we also synthesized the findings of qualitative research on warexposed families, as an attempt at increasing our understanding of the processes through which war exposure impacts parenting and children's adjustment. Our search process yielded 10 qualitative publications with data on 1,042 participants (age range = 0-18). We extracted all statements in the original articles related to war-exposure, parenting practices, and child adjustment.

#### **Results**

Ouantitative Strand. Our quantitative analysis revealed that, in addition to the direct associations between war exposure and child adjustment, there were indirect associations between war exposure and child adjustment that could be explained by parents showing less warmth and more harshness towards their children. contrast, more war exposure was associated with parents' use of behavioral control, although there was an association for cross-sectional studies specifically. That is, war exposure seemed to be associated with less behavioral control by parents, but this association did not exist over time.

**Oualitative** Strand. **Families** categorized into having faced four different types of war-related traumas, namely, living under threat (i.e., living under the possibility of an attack), living in extreme danger (e.g., displacement), being bereaved (i.e., having lost a family member due to the war), or being raped. Families became mainly concerned with keeping their children alive and with providing for their basic needs. In general, most war-affected families felt a reduction in their parental self-efficacy beliefs; however, the effects of war exposure on parenting practices seemed to depend on the specific nature of the exposure.

For example, living in extreme danger increased parents' stress levels, which made them less capable of offering warmth and support, and more likely to engage in harsh and inconsistent discipline, unlike "merely" living under threat where parents still were able to offer warmth and support, and adequately monitor their children's whereabouts. Second, while rape and

bereavement were studied in a single study each, it seemed that those experiences had opposing effects on parenting practices. Mothers who were raped were reminded of their trauma through their children's symptomatic behavior (e.g., recreating the rape scene in their play), they avoided engaging with their children and became overly withdrawn and insensitive, while bereaved parents increased their provision of parental warmth and reduced their punitive discipline.

#### **Conclusions**

compromised children's War exposure adjustment, in part through reduced parental warmth and increased parental harshness, but not parents' behavioral Importantly, however, control. qualitative meta-synthesis suggested that the specific pattern of associations depended on the nature of traumatic exposure. Specifically, living under threat of war seemed to make parents warmer, but at the same time, more overprotective of their children. In displacement or dangerous settings, most parents became less capable of adequately exercising behavioral control and monitoring their children's whereabouts. Parents were also harsher, less warm, and more inconsistent in those settings. Thus, while the general pattern suggested that the more families are exposed to war, the more adverse their parenting, the qualitative meta-synthesis suggested that there seemed to exceptions to that pattern, based on the type of traumatic exposure.

Our findings highlight the importance for future research on parenting in times of war to more carefully assess the diverse types of exposure experiences families go war test and separately their through associations with parenting practices. Namely, future research needs to examine the heterogeneity in response to war, while paying special attention to resilience. In addition, more attention needs to be paid to mechanisms through which

exposure shapes parenting practices. Also, more rigorous longitudinal research on how war exposure, parenting practices, and child adjustment are related over time is vital. Finally, intervention workers might be able to reduce some of the adverse effects of war exposure on children, by targeting parenting practices that seem to be most affected by war exposure. Namely, through interventions aimed at increasing parental warmth and reducing parental harshness. Perhaps this way, children growing up in times of war might be given a better future.

#### Reference to original publication

Eltanamly, H., Leijten, P., Jak, S., & Overbeek, G. (2019). Parenting in times of war: A meta-analysis and qualitative synthesis of war exposure, parenting, and child adjustment. *Trauma, Violence, & Abuse.* doi: 10.1177/1524838019833001

Supplemental materials: <a href="https://osf.io/zp6gm/">https://osf.io/zp6gm/</a>

#### 2. New Methodological Developments from the Netherlands

#### Caspar J. Van Lissa

(Utrecht University, The Netherlands)

The European community of adolescence researchers is sophisticated and progressive when it comes to statistical methods. A combination of friendly competition and international collaboration continues drive our field forward. It is no coincidence that many methodological innovations that profoundly impacted developmental psychology have originated in Europe. I will mention some that came from the Netherlands, as this is the focal country of this newsletter: The move towards person-centered and experience sampling methods, such as the randomintercept cross-lagged panel model and dvnamic structural equation model developed by my colleague Ellen Hamaker, in collaboration with Loes Keijsers; two different approaches to network analysis: Social network analysis by Tom Snijders, and variable-centered network analysis by Denny Borsboom; and Bayesian informative hypothesis testing, by Herbert Hoijtink and colleagues.

During my PhD and postdoctoral work on parenting and adolescents' development of empathy and emotion regulation, I also pursued ever-increasing eagerly methodological sophistication (e.g., Van Lissa et al., 2017; 2019). Two years ago, I was given the opportunity to make more of a contribution to methodological developments, whilst still retaining foothold in developmental research: As assistant professor of Methodology and Statistics, embedded in the Utrecht Platform for Applied Data Science (UPADS). Data science is a catchy name for statistics, with a greater focus on replicable results, and on machine learning methods. My focus is on adapting these methods for developmental research. In this newsletter, I will provide a brief overview of my latest work on three topics of particular relevance developmentalists, in the hope that some readers might be inspired to use them in their work: 1) Meta-analysis, which refers to the practice of statistically combining findings from multiple studies, 2) mixture modelling, sometimes also referred to as latent class analysis, which is a way to identify latent subgroups in the data, and 3) Bayesian informative hypothesis testing for structural equation modelling.

# Meta-analysis and the problem of between-studies differences

Meta-analysis is often heralded as the golden standard of research synthesis; a way to derive reliable insights by aggregating published findings. Since the replication crisis in psychology, reliable findings have been in high demand. But is the prestige accorded to meta-analysis always warranted? I have consulted on many

developmental meta-analyses, and noticed a pattern: Each combined a relatively small sample studies addressing roughly similar research questions, but which had been investigated in different countries, using different instruments and methods. Such between-studies differences can introduce substantial heterogeneity in the effect sizes. In classic meta-analysis, the amount of heterogeneity can be quantified using a random-effects model. The problem is that this model assumes the heterogeneity to be random, and normally distributed. This assumption is violated if some of the aforementioned between-studies differences influence the effect size. You can code these differences as moderating variables, and control for their influence using metaregression – but this requires many more observations than predictors. If you include too many predictors, the model will "overfit": Parameters jump around in order to capture not just true effects, but also noise in your data. This is not a rare scenario: I have encountered many data sets where the number of moderators was greater than the number of studies included. We need an exploratory approach to identify relevant moderators in meta-analysis, that is robust even when the number of moderators is large relative to the number of studies.

To address this problem, I have developed the MetaForest algorithm: An adaptation of the machine learning algorithm "random forests" for meta-analysis (Van Lissa, 2018). Random forests can handle many predictors relative to the number of studies, they are robust to overfitting, inherently capture interactions between moderators and nonlinear effects, and explore the data more efficiently than linear regression. Simulation studies indicate that, in most cases, MetaForest has sufficient power with little as 20 studies. It is thus a useful solution, sample sizes even when are small. MetaForest is open source software. available as an R-package on CRAN ("metaforest"; Van Lissa, 2018). It can be incorporated into an existing meta-analysis,

to check for relevant moderators: Just include all coded moderators in a MetaForest analysis; it will identify which ones reliably influence the effect size, and plot the shape of each moderator's relationship with the effect size. You can then proceed with a simplified meta-regression model, including only relevant predictors.

#### Visualizing mixture models

Mixture models, or latent class analyses, have long been popular in European developmental psychology; perhaps in part because they are an elegant way to represent Marcia's identity statuses, and identity research is a mainstay of our community. A downside of this popularity, however, is that they are sometimes inappropriately used. Good visualizations are one of the most useful tools to help determine whether mixture modeling is appropriate, and to reveal the optimal number of clusters in the data. Currently, mixture models are typically represented as bar charts of class means, on most likely posterior membership; occasionally enhanced with standard error bars (Figure 1).

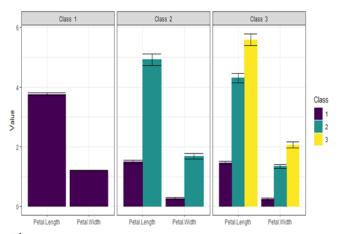


Figure 1.

These plots are uninformative, as the bars do not reveal the distribution of the underlying data. Moreover, variances are often a parameter in the model, and these are not visualized at all. I have developed the R-package "tidyLPA", in collaboration with Joshua Rosenberg, which allows users to

conduct a full latent class analysis with just one line of code, and provides clearly formatted output to facilitate reporting according to best practices. Furthermore, tidyLPA can rely entirely on free open source software, but it can also use the commercial software Mplus, if it is installed: The results are the same. That means users do not need to purchase licensed software. Most importantly, however, the package includes two new visualizations: First, the "enhanced profile plot", with raw data weighted by posterior class probability Separate classes (Figure 2). can recognized as clusters of dots with the same color. If the variances are a model parameter, these are represented in a way that resembles a boxplot. Second, the "mixture density plot" (Figure 3). Paying homage to the fact that "finite mixture models" refer to a mixture of several normal distributions, these plots visualize those mixed normal distributions using a normal density function, weighted posterior class probability. For the more technically advanced user. Ι contributed similar functions, but with more advanced functionality, Michael to Hallquist's R-package, "MplusAutomation".

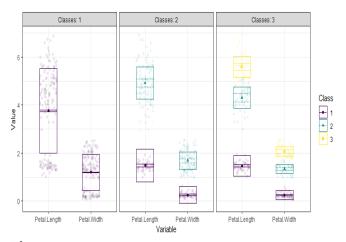


Figure 2.

MplusAutomation is software to run Mplus models in batch from R, and these new functions greatly facilitate conducting growth mixture models and latent transition analysis, and creates beautiful plots for both.

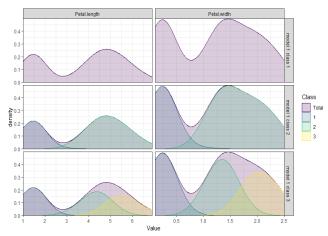


Figure 3

# Bayesian informative hypotheses for structural equation models (SEM)

With the complex SEM-models that are common in our field, researchers often have hypotheses about many parameters. Yet the problem of multiple testing, consequences for Type I errors (finding false-positive results that do not replicate), rarely considered. The Bayesian framework offers an attractive alternative, as it does not suffer from Type I (or Type II) errors. Bayesian tests are also easier to interpret: They provide degree a confidence in the truth of an informative hypothesis, given the data - instead of a dichotomous decision to reject-or-not-reject a meaningless null-hypothesis. Yet many researchers are deterred by the complex estimating procedures required for Bayesian analysis, and the specification of priors. In collaboration with Herbert Hoijtink, Yves Rosseel, and others, we have developed Bayesian software that evalutates hypotheses for frequentist models estimated in "lavaan" (a free R-based alternative to Mplus, with similar syntax and output). The hypotheses can be conveniently specified as a text string; for example, to evaluate the hypothesis that the mean of variable A is bigger than that of variable B, one might simply write: "A > B". You can refer to any parameter in the lavaan output simply by its name. The package intelligently applies default priors, derived from a fraction of the

information contained in the data. Previous work by Herbert Hoijtink (2019) shows that, in most cases, these default priors are adequate to obtain accurate Bayes factors. This user-friendly software, which uses the output of existing SEM-analyses, makes it very easy to conduct Bayesian informative hypothesis evaluation.

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#### 3. Research project within CID: Intergenerational transmission of relationships and psychopathology in adolescence and young adulthood

#### Susanne Schulz

(Utrecht University, The Netherlands)

The question why some children thrive while crucial focus don't is a developmental psychology, and is not only rooted in the child's disposition, but also in the environment surrounding the child. To better understand how the interplay of child characteristics and environmental factors contribute to individual differences, the Consortium of Individual Development https://individualdevelopment.nl/) investigates child development from birth to adolescence. CID unites seven research institutes in the Netherlands that examine child development from a wide range of behavioral and social science disciplines, including behavioral genetics, developmental (neuro)biology, psychiatry, neurocognitive science, developmental psychology, pedagogical sciences, communication science, and mathematics. It comprises four research lines correspond to four main aims: 1) to investigate longitudinal changes in brain structure as a mechanism underlying the associations between child environmental factors; 2) to investigate child characteristics and differential susceptibility in shaping the effects of environmental factors; 3) to investigate intergenerational transmission underlying mechanisms to understand why children continue or fail to thrive; and 3) the use of animal and advanced mathematical models to investigate long-term interactive between individual effects environmental factors on developmental outcomes. To realize these aims, CID existing large-scale encompasses all longitudinal Dutch cohort studies on socioemotional development, which span an extensive range of measurements

together follow ten thousands of children and adolescents over several decades.

My research project is part of the third research line of CID, and focuses on the intergenerational transmission relationship quality and psychopathological adolescence symptoms in and adulthood. Establishing positive relationships with social partners is a key developmental task in adolescence. adolescents fail form to positive relationships with peers and romantic partners, they are at risk for developing adjustment problems, such psychopathological (i.e., internalizing and externalizing) symptoms (e.g., Deater-Deckard, 2001; Lakey & Cronin, 2008). Adolescent psychopathological symptoms are common and persistent, and thus compromise well-being even beyond adolescence (Kessler et al., 2012). **Particularly** interaction and problem behaviors are often observed inadvertently continue from one generation to the next (see Meeus, 2016; Connell & Goodman, 2002 for reviews). At the same time, parental behaviors might not only shape child behaviors, but these associations might be bidirectional in that parent and child reinforce each other's behaviors (e.g., Bell, 1968; Branje et al., 2008). However, much remains unknown about the extent to which intergenerational associations are due to transmission from parents to children underlie mechanisms and which transmission.

Using a longitudinal approach with data from up to three generations, my project focuses on how interaction patterns and problem behaviors are transmitted from parents to adolescents, and how interactions between parents and adolescents might exacerbate problem behaviors. Specifically, we investigate the reciprocal associations between parental and adolescent relationships and psychopathology to test whether they are driven by intergenerational transmission, and to examine their long term effects on adolescent development. To

assess these questions, we use metaanalyses of the published literature, and existing longitudinal data from two largescale longitudinal Dutch cohort studies. These studies are "Research on Adolescent Development and Relationships" (RADAR), and the "TRacking Adolescents' Individual Survey" (TRAILS). Both studies Lives questionnaire. include behavioral. physiological, genetic, and observational data. Additionally, we use novel longitudinal modeling techniques to comprehensive and detailed insights into the study of intergenerational transmission.

Preliminary results from two of our ongoing studies indicate that parental interaction and problem behaviors predict adolescent interaction and problem behaviors across adolescence, but also highlight adolescent behaviors in turn influence parental behaviors over time. Specifically, in a meta-analytic investigation on relationship investigated transmission, we supportive and negative dimensions of parent-adolescent relationships future relationships with peers and romantic partners across time, and whether these associations might be bidirectional. Using multilevel meta-regressions, we found that more supportive and less negative parentadolescent relationships were linked to more supportive and less negative future peer and romantic relationships. Using meta-analytic structural equation modeling, we further unidirectional found links between supportive parent-adolescent and future peer relationships, but bidirectional links between negative parent-adolescent and future peer relationships.

In a second investigation that focused on the longitudinal (bidirectional) associations between parent and adolescent internalizing and externalizing problems throughout adolescence, we not only found that maternal symptoms might play a greater role in the transmission of internalizing psychopathology, but also that adolescent internalizing symptoms in turn predicted

parental symptoms. Across adolescence, mothers' internalizing and externalizing symptoms predicted children's internalizing and externalizing symptoms, respectively, in the following year – but only for girls, and not for boys. Neither fathers' internalizing, externalizing, symptoms predicted children's internalizing and externalizing symptoms. Adolescent internalizing predicted symptoms, however. mothers' and fathers' internalizing symptoms in the following year. No such associations were found for externalizing symptoms.

Together, these first results highlight the importance of positive parent-adolescent relationships and parental well-being for adolescent functioning, and emphasize the need for interventions to strengthen the bond between parents and adolescents. To help fully understand how parent and adolescent symptoms mutually influence each other and thus help to develop effective interventions, we need to further identify factors that drive these associations. In this research project, we will therefore further examine the underlying mechanisms that determine the transmission relationships psychopathology and in adolescence by investigating the mediating role of emotional states and the moderating role of polygenic risk scores.

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# 4. Genetic and Environmental Influences on Self-Control

# <u>Yayouk E. Willems, Meike Bartels & Catrin Finkenauer</u>

(Vrije University Amsterdam and Utrecht University, The Netherlands)

Adolescence is marked by a range of selfcontrol challenges. Adolescents have to focus on their homework while being distracted by social media, say no to an alcoholic drink at a party while the cool kids are drinking beer, and regulate their emotions and insecurities when exposed to picture-perfect Instagram posts. Failing to exert self-control and navigate these challenges successfully places adolescents at risk. For example, adolescents with low self-control are more likely to fail in school, drink alcohol, be arrested for crimes and develop mental disorders as compared to their peers with high self-control. Because self-control is such a powerful predictor of health, wealth, and public safety across the lifespan, it is important to identify factors shaping its development.

Parenting is one such factor, with parents shaping the self-control capacities of their children across early and middle childhood. However, studies extending this work to vield mixed adolescence findings. Adolescents strive for independence, and rely more on their friends, and less on their parents. Additionally, adolescents increasingly become active agents of their own development, and their levels of selfcontrol are likely to influence parenting practices. This raises the question: are parenting and self-control still associated in adolescence? And if so, what is the direction of this effect? In order to answer these question, we applied a meta-analysis quantifying the overall relationship between parenting and self-control from early adolescence to early adulthood (Li, Willems, Dekovic, Bartels, & Finkenauer, submitted). Meta-analysing 191 studies revealed that parenting and self-control are associated significantly concurrently (r=.204, p<.001) and longitudinally (r=.157, p<.001). Longitudinal analyses revealed that adolescents' self-control also influences subsequent parenting (r=.155, p<.001). Moderator analyses showed that the effect sizes were largely invariant across cultures, ethnicities, age of adolescents, and parent and youth gender. Our results point to the importance of parenting in individual differences in adolescent self-control and vice versa.

While the associations between parenting and self-control are significant, the magnitude of the effect sizes suggest that there are additional factors at play in the development of self-control. Twin studies show that self-control is heritable, but heritability estimates range between 0% and 90%, making it difficult to draw firm conclusions. We therefore conducted a meta-analysis quantifying the heritability of self-control (Willems, Boesen, Li, Finkenauer, & Bartels, 2019). conducted a systematic search including 31 twin studies assessing the heritability of selfcontrol across the lifespan. Our multi-level meta-analyses revealed an overall monozygotic twin correlation of 0.58 and an overall dizygotic twin correlation of 0.28, resulting in an overall heritability estimate of 60% for self-control. This means that the differences in self-control between people is for 60% explained by genetic differences between people in a certain population. The heritability of self-control did not vary across gender or age. The heritability did differ across informants, with stronger heritability estimates based on parent reports as compared to self-reports or observations. As such, when aiming to understand the etiology of self-control, we should also take genetic factors into account.

The results of both meta-analyses emphasize that when aiming to understand the etiology of self-control, we should take into account both environmental and genetic factors. Taking this into account, we aimed to further investigate the association between family conflict and self-control, while applying a genetically sensitive design (Willems, de Zeeuw, van Beijsterveldt, Boomsma, Bartels, & Finkenauer, 2019). Assessing self-control with the ASEBA Self-Control Scale (Willems, Dolan. Beijsterveldt, de Zeeuw, Boomsma, Bartels, & Finkenauer 2018), and using data from a large sample of twins aged 14 (N = 9,173), we fitted a series directional models to examine the direction of effects for the association between family conflict and selfcontrol including (1) reciprocal effects, (2) unidirectional effect from family conflict to

low self-control, (3) unidirectional effect from low self-control to family conflict, and (4) common genetic susceptibility. The results suggested a unidirectional pathway model in which family conflict leads to low self-control in adolescence, with genetic factors also playing a role in explaining the association (see Figure 1). This shows that adolescents experiencing family conflict are at risk to for hampered self-control capacities, with family conflict being a robust predictor of low self-control through common genetic factors but also through direct causal influences.

Future research might similarly apply models that take into account both genetic and environmental factors, as this allows to deepen our understanding of the dynamic processes underlying the development of self-control. The way in which genetic and environmental factors correlate (passive-, evocative- and active- gene environment correlation) or interact (gene x environment interaction) are a particularly interesting area of research, which we expect to blossom in the years to come.

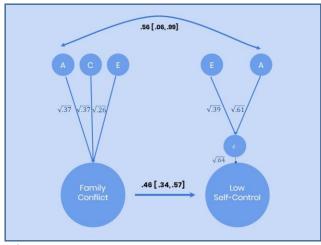


Figure 1.

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# 5. The ups and downs of social behavior in emerging adolescence

#### Mara va<u>n der Meulen</u>

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Adolescence is characterized by tremendous changes in social behavior and interaction. Inclusion in the peer group becomes increasingly important, and can lead to significant improvements in well-being, social exclusion whereas can detrimental effects. Individuals can advance their acceptance in the peer group by showing prosocial behavior, defined as acts intended to help or comfort another individual. However, if those prosocial acts are against the social norm established by the group, the individual risks being excluded from social interaction. One of the research questions within the Leiden Consortium on Individual Development (L-CID; part of the Brain and Development Research Center) is whether individuals

would decide to act prosocially towards a victim of exclusion in a situation with unknown others, and how that process would be supported by neural activation.

We used a four-player Prosocial Cyberball Game to create a situation of observed social exclusion. During this game, the participant played a ball-tossing game with three anonymous others. In the first block of the game all players received the ball an equal amount of times. However, during the second block one of the players was excluded by the two other players. This the participant provided with opportunity to show prosocial behavior by including the excluded player. In our first study (van der Meulen, van IJzendoorn, & Crone, 2016) we found that late adolescent girls (N = 23, aged 18-19) indeed prosocial demonstrated this behavior towards the excluded participant during the unfair block, in comparison to the fair block. Moreover, when participants engaged in prosocial behavior, we found increased neural activity in brain regions involved in cognition (the temporo-parietal junction and anterior insula) and reward processing (nucleus accumbens). findings show that adolescents show prosocial behavior to compensate for another individual's social exclusion, and that this behavior is supported by sociocognitive and reward-seeking processes in the brain.

To investigate whether these findings were specific to adolescence, or whether a younger age group might show similar behavioral and neural patterns, we next studied three pre-adolescent samples (N = 18; N = 27; N = 26; aged 7-10, approx. 50% male; van der Meulen et al., 2017). In all samples, we found that adolescents showed prosocial toward the excluded participant during the Prosocial Cyberball Game, but we found no significant neural responses associated with processes. underlying socio-cognitive Additionally, we investigated whether the

participants worried about being excluded from the game themselves after showing prosocial behavior towards an excluded participant. In support of this hypothesis, participants were temporarily when excluded from the game, we observed activity in neural regions associated with perception social management (orbitofrontal cortex). In contrast, when participants received the ball during the game, we observed activity in saliency- and regions reward processing (anterior cingulate cortex and ventral striatum). A meta-analytic approach showed that these neural patterns were consistent over the three samples, indicating a coherent pattern of neural activation for social exclusion and inclusion in pre-adolescence. Together, these findings indicate that pre-adolescents engage in prosocial behavior as a response to observed exclusion, but that they are also concerned about their own inexclusion.

To investigate whether variance in social and accompanying behavior is driven by geneticprocesses environmental influences, we explored the heritability of prosocial behavior and social exclusion in a large pre-adolescent twin sample (N = 500, aged 7-9, approx. 50%Meulen, male: van der Steinbeis. Achterberg, van Ijzendoorn, and Crone, 2018). Similar to our earlier studies, we found that pre-adolescents showed prosocial behavior toward the excluded participant during the Prosocial Cyberball Game. Behavioral genetic modelling indicated that prosocial behavior showed no influence of genetics or shared environment. In line with the aforementioned meta-analysis of three small samples, we found that social exclusion was again associated with activity of affective salience network orbitofrontal cortex, anterior cingulate cortex), whereas social inclusion associated with regions for reward related processing (ventral striatum and anterior insula). In addition, we found that a region specialized in mentalizing (precuneus) was activated during prosocial behavior. Notably, activity associated with social exclusion could be partly attributed to genetic factors, and mostly to unique environmental factors.

One main finding of these studies is that neural reactions to social exclusion in preadolescence are comparable to reactions of older adolescents. These neural responses are driven by a combination genetic factors and unique environmental illustrating the relevance of individual experiences in the perception of social exclusion (see also Will, van Lier, Crone, and Güroğlu, 2016). The second main finding is that both pre-adolescents and adolescents ranging from 7-19 years) prosocially towards an excluded, unfamiliar other. Furthermore, this prosocial behavior is supported brain regions associated with thinking others' about perspectives. Particularly in late adolescence, prosocial behavior is also associated with reward processing brain regions. Prosocial behavior and its underlying neural processes seem primarily driven by unique environmental factors. In line with this finding, it should be noted that prosocial behavior tends to vary across context and towards recipients. Within the Brain & Development Research Leiden University, at methods are used to map this important yet complex behavior, including a paradigm that distinguishes between the effects of earning money for oneself, versus earning money for charity (Spaans, Peters, & Crone, 2018), as well as economic games to measure distributions between self and (Spaans, Will, van Hoorn, & Güroğlu, 2018; van de Groep, Meuwese, Zanolie, Güroğlu, & Crone, 2018). Behavioral measures and neuroimaging tools will continue to be combined in order to better understand individual variation in adolescent prosocial behavior.

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# From the EARA Young Scholars (former SECNet):

**Updates from EARA Young Scholars** 

<u>Submitted by Marlies Maes,</u> KU (Belgium)

Dear EARA-members,

We would like to give you an update on the EARA Young Scholars, the network for all EARA students and early career researchers (including postdocs and assistant professors). During the EARA conferences, we organize several activities but also in between the conferences, EARA's young network remains active scholar enthusiastic! We want to thank all young scholars who contributed to our activities and who increased and strengthened our community by becoming an EARA-member since our conference last September in Ghent.

#### **Emerging Scholar Spotlight**

Each month, we put a recent publication, authored by an EARA Young Scholar, in the spotlight. Written in an accessible, nontechnical language, these spotlights are the best way to stay updated on the most recent work of our vibrant community! The spotlights are distributed by email to all EARA members, appear on the EARA website, and are shared on our Facebook page. If you are an EARA Young Scholar and published study recently a international journal, you can contact Sofie Danneel (sofie.danneel@kuleuven.be)

contribute to the next Emerging Scholar Spotlight!

#### **National Representatives**

We are very happy to have welcomed many Scholar EARA Young National Representatives since the last **EARA** conference. The involvement of the national representatives is essential in strengthening the connections among young scholars, and in engaging new, interested scholars in EARA. We would like to thank the former representatives national for contributions to our network, and the new national representatives for their willingness to strengthen and keep our network lively! Check out the EARA website for the profiles of all national representatives, and feel free to contact the representative of your country if you have any ideas to promote EARA among young scholars. Your country is not represented yet, and you would like to fulfill role of your country's representative? Then please send an email to Ioana Pop

(popeleonoraioana@gmail.com).

#### **EARA Young Scholar Facebook Page**

Do you want to stay updated on the latest news about adolescent research? Follow our Facebook page! EARA Young Scholars Sofie Danneel and Flore Geukens regularly post about recent publications, vacancies, and relevant activities including conferences, workshops, and summer schools. Also feel free to use the page yourself to post any interesting information to share with your peer adolescence-researchers!

Your EARA Young Scholars committee,

Marlies Maes, Ioana Pop, Sofie Danneel, Elina Marttinen, and Susanne Schulz.

# Announcement of the Summer School: Modeling the dynamics of intensive longitudinal data

Submitted by Caspar J. van Lissa (University of Utrecht, The Netherlands)

The Summer School on Modeling the dynamics of intensive longitudinal data will be held at the Faculty of Social and Behavioural Sciences at Utrecht University, The Netherlands. For more information, please check the following website:

https://www.utrechtsummerschool.nl/cours es/social-sciences/modeling-the-dynamicsof-intensive-longitudinaldata?fbclid=IwAR2izPSK ReuYDIUtFxXMzIvH\_f7-aLkRAAfu9x2yxhmdL7DxS5wlUTFA.

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