BSc in Psychology

Differences in Protective Factors on Depression in Youths: Comparative study between pre- and post-pubescent.

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Foreword

Submitted in partial fulfilment of the requirements of the BSc Psychology degree, Reykjavik University, this thesis is presented in the style of an article for submission to a peer-reviewed journal.
Abstract
Depression in youths is an increasing public health concern. In order to prevent more cases of depressed youths, additional preventive research must be conducted to better understand the role of protective factors on depression. The present study observed effect-sizes and significance of pre-researched protective factors; parental monitoring, parental support, family structure, and sport participation, on Symptom Checklist-90 subscale scores, with a sample obtained from the Icelandic Centre for Social Research and Analysis. 2064 children aged 10-13 years old were compared to 1674 adolescents aged 15-18, using analysis of covariance method. Family structure protective factor did not have a significant effect on the pre-pubescent depressive scores, but had a significant effect for the adolescents’ depressive scores. There was an interaction effect of age and sex on depressive scores of the pre-pubescents, showing an increasing trend in depressive scores after 5th grade in females. Due to violations of assumptions and differences in sample size, the validity of the study was questioned. Future research on preventive processes in youths are needed for an effective preventive policy.

Keywords: Prevention, youth mental health, effect-sizes, protective factors, gender-differences, SCL-90.

Útráttur
Framtíðarrannsóknir á verndandi áhrifum hjá ungmmenum eru þöfar fyrir árangursríka forvarnarstarfsemi.

Lykilhugtök: Forvarnir, ungmennageðheilsa, áhrifastærðir, verndandi þættir, kynjamunur, SCL-90.
Differences in Protective Factors on Depression in Youths: Comparative study between pre- and post-pubescents

Depression is a common mood disorder, with over 40 million cases in Europe alone (World Health Organization, 2017). Depression is also a rising health problem, estimated to account for 6% of the world’s disability adjusted life years (DALY) by the year 2020 (World Health Organization, 2004). DALY accounts for the total number of healthy life-years lost due to disability and/or early mortality (Barker & Green, 1996). Even though the mood disorder is more common among adolescents (Abela & Hankin, 2007: p. 36), it is not necessarily age-specific, and can affect children as well as adults.

It has been estimated that about 1% of pre-pubescent children have major depression (by Franklin's (2010) definition, pre-pubescence is 12 years old and younger, whereas post-pubescence is 14 years old and older), and about 7% of post-pubertal youth (Abela & Hankin, 2007: p. 9). Depression rates have been increasing amongst youth populations in past decades (Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015; Wagner, 2018), and in the United States, suicide rates in young females of emerging pubescence (10-14 year-old) have increased by 200% since 1999 (Curtin, Warner, & Hedegaard, 2016). Therefore, it is important to identify and treat depression cases among youths, since depressive disorders are amongst the most prevalent disorders in adolescents that commit suicide (Gould, Greenberg, Velting, & Shaffer, 2003).

Avenevoli et al. (2015) found that female youths are at a special risk for depression and suicide, and stated that preventive policies should therefore be tailored to them specifically, due to the rapid increase in depression rates as children age into adolescence (Angold & Rutter, 1992; Ge, Conger, & Elder Jr., 2001; Wade, Cairney, & Pevalin, 2002). This calls for supplementary information in the field of preventive research on youths. The goal of prevention is to identify risk factors on, for example, depression and to remove or
reduce them via public policy (Evans et al., 2005: p. 59; Greenberg, Domitrovich, & Bumbarger, 2001; Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001; World Health Organization, 2014).

In the Institute of Medicine’s (IOM) report in 1994, it was suggested that the development of prevention comes in five stages, with the first two being identification of influencing factors and research into the relationship of said factors on a specific disorder (IOM, 1994, as cited in Evans et al., 2005: p. 62). IOM also identified three categories of prevention programs (Greenberg et al., 2001): (1) Universal prevention aims to reduce risk in the general public, including those who are not at a particular risk. (2) Selective intervention is aimed at subgroups, identified by known risk factors. Selective intervention is aimed at those at a greater risk. Young females might be categorized in this group, as they are at risk for depression and suicide in adolescence (Avenevoli et al., 2015). (3) Indicated prevention targets those with overt symptoms related to the targeted disorder, but have not met the diagnostic criterion for said disorder. Targeted group for this type of intervention might be individuals seeking healthcare for onset mental illnesses or youths seeking school-based counseling for an undiagnosed problem.

A brief review of youth mental health prevention literature would reveal that parental support (Asgeirsdottir, Gudjonsson, Sigurdsson, & Sigfusdottir, 2010), family structure (Bjarnason & Thorlindsson, 1994; Sigfusdottir, Asgeirsdottir, Gudjonsson, & Sigurdsson, 2013; Sigfusdottir, Farkas, & Silver, 2004; Wight, Botticello, & Aneshensel, 2006), parental monitoring (Bjarnason & Thorlindsson, 1994; Sagrestano, Holmbeck, Paikoff, & Fendrich, 2003), and sport participation (Asgeirsdottir et al., 2010; Bjarnason & Thorlindsson, 1994) are common protective factors of depression and suicide. Age (Asgeirsdottir et al., 2010) and gender, specifically, being female, (Smokowski, Bacallao, Cotter, & Evans, 2014; Wight et al., 2006; World Health Organization, 2017) have also shown an influence on depression in
youths. Angold & Rutter (1992) found that there were no gender differences in depressive symptoms until age 11 in a psychiatric population. However, Ge et al. (2001) found that gender differences were apparent after age 12-13 in a school sample. These studies, however, do not take developmental or hormonal status into account, with age demographics ranging from nine-years-old to 19. If research would find that a certain risk or protective factor would only influence individuals before puberty as opposed to post-puberty, it would be reasonable to tailor prevention policies in the favour of this information. If prevention policies would be age-specific, gender-specific, and developmental-specific, then it would be reasonable to infer that there would be increase in sensitivity, making more effective progress. To avoid children having the same preventive protocol if research indicates different effects of certain variables, adequate comparative research on the effects and significance of risk and protective variables must be conducted to make the differences unambiguous. Few studies, if any, have observed differences in protective factor effects over the course of puberty.

The research question of the present study is whether the same protective factors on youth depression have a significant effect before and after puberty. The goal of the study is to provide supplementary and possibly practical information for preventive policies, representing the first two steps in prevention formulation according to IOM (Evans et al., 2005: p. 62). As studies have shown the emergence of gender differences over the course of puberty (e.g. Ge et al., 2001), and with female adolescents being at more risk for depression (Avenevoli et al., 2015; Sigfusdottir, Asgeirsdottir, Sigurdsson, & Gudjonsson, 2008; World Health Organization, 2017), the hypotheses are: (1) The post-pubertal group will show significant gender differences in depressive scores with females having significantly higher scores. (2) The pre-pubescent group will not show significant gender differences in depressive scores. (3) The effects of protective variables will have larger significant relationship with depressive scores for the post-pubertal adolescents compared to the pre-
pubescent group. (4) Age will have a significant positive effect on depressive scores for the adolescents, but not children.

**Method**

**Participants and Sampling Procedure**

The data were acquired from the Icelandic Centre for Social Research and Analysis (ICSRA). ICSRA annually conducts a national survey for all primary school children aged 10 to 12 in Iceland, as well as all adolescents in secondary school (more information at www.rannsoknir.is/en/about; “ICSRA,” 2018). The primary school data were gathered from the year 2015, but the secondary school data from the year 2016. Before ICSRA supplies the schools with surveys, they send a letter to every parent of a potential participant (Appendix A and B). If there are no objections, the teachers then admit the surveys to the students at an advertised time. The students were encouraged to ask for help if needed and were free to stop participation at any time. For greater detail of the sampling procedure, see Guðmundsdóttir et al. (2015). The survey for the children (ages 10-12) consisted of 55 questions on 20 pages. The survey for adolescents had 85 questions on 32 pages. There were 10,917 valid questionnaires from the younger group, and there-of 2064 random questionnaires were extracted for analysis. Age was measured with the question “What grade are you in?” with the optional answers; “5th grade”, “6th grade”, and “7th grade” (Appendix C). There were 1023 (49.6%) male and 1041 (50.4%) female pre-pubescents. 702 (34.1%) were in their 5th school year (age 10-11), 691 (33.6%) in their 6th school year (age 11-12), and 662 (32.2%) in their 7th school year (age 12-13). The response rate was 85.5%.

There were 10,717 valid questionnaires from the secondary school survey in 2016, and of those 2008 random responses were extracted for analysis, 1003 (50%) male and 1005 (50%) female. The response rate was 71%. See Pálsdóttir et al. (2017) for a more thorough description of the sampling procedure. The adolescents were given optional years of birth to
indicate their age: 2002, 2001, 2000, 1999, 1998, 1997, 1996, 1995, and other (Appendix D). Individuals over the age of 18 were excluded from the secondary school group, which left the data with 1674 questionnaires, 821 (49%) male and 853 (51%) female. There were nine individuals in their 15th year of age (0.5%), 588 in their 16th year (34.5%), 502 in their 17th year (29.5%), and 445 in their 18th year (26.1%). There were 29 (1.5%) that marked their age as “other”. The mean age was \( M_{age} = 16.75, SD = 1.34 \).

**Measurements**

Both surveys had the *Symptom Checklist 90* (SCL-90) depressed mood subscale. The subscales presented did not include all questions as the original SCL-90 subscales (see Sigfusdottir et al. (2013) for a similar approach). The SCL-90 for depressed mood subscale is a 13-item list of depressive symptoms, which asks if any of the symptoms have been present in the past week (Derogatis, Rickels, & Rock, 1976). The children’s survey contained seven items of the depressed mood inventory, appropriate for their age, with a Cronbach’s alpha value of \( \alpha = 0.83 \) (Appendix E). The questions were; (1) “You were sad or had little interest in doing things”; (2) “You had little appetite”; (3) “You felt lonely”; (4) “You cried easily”; (5) “It was hard for you to sleep or fall asleep”; (6) “Stomach ache”; and (7) “Headache”. Possible answers were: “Never”, “Almost never”, “Seldom”, “Sometimes”, and “Often”.

The adolescent’s survey had 10 items of the depressed mood inventory with a Cronbach’s alpha value of \( \alpha = 0.87 \) (Appendix F). It included the same questions as in the children’s survey, but had also the questions: “You were tense”, “Suddenly scared for no reason”, and “You were sad”. Possible answers for this survey were: “Almost never”, “Seldom”, “Sometimes”, and “Often”. Because of the differences in scaling, the scores were converted to z-scores for equal measurement. Previous literature on the inventory showed internal reliability of \( \alpha > 0.83 \) (e.g. Andrews, Qian, & Valentine, 2002; Holi, Sammallahti, & Aalberg, 1998).
Covariates

Family structure

Family structure has been observed as an influential factor on depression and suicide (e.g. Bjarnason & Thorlindsson, 1994; Sigfusdottir et al., 2013). This factor was assessed with the question “Who lives at your home?”. The children’s survey had seven possible answers, the first being “I live with both parents”. The other options were some alternative forms of living arrangement, for example, “I live mostly with my mother” or “I live mostly with my father” (Appendix G). In accordance to Sigfusdottir et al. (2013) the answers were coded as 1 = lives with both parents and 0 = any other answer. The adolescent survey had 10 optional answers, the first being “Both of my parents” (Appendix H). The answers for the children and adolescents were coded in the same way. For the younger group, 71.9% lived with both parents and 28.1% lived under some other arrangement. As for the adolescents, 66% lived with both parents and 34% under some other arrangement.

Parental monitoring

Sagrestano et al. (2003) observed parental monitoring as a protective factor for depression in young children. Parental monitoring was assessed with two questions: “My parents know my friends” and “My parents know the parents of my friends”. The answers were on a four-point ordinal scale: “Very much applies to me”; “Somewhat applies to me”; “Does not somewhat apply to me”; and “Really does not apply to me” (Appendices G and H). These questions were computed together into one covariate. The answers were coded with disagreeable answers having a lower value, for example, “Really does not apply to me” were coded as 1, whilst “Very much applies to me” were coded as 4.

Parental support

Parental support has shown a protective quality for depression in youths (Asgeirsdottir et al., 2010). The 2015 survey only had one question reflecting this construct
whereas the 2016 survey had five questions (Appendix H). To avoid discrepancy between the data, it was assessed with the only common question “How easy or hard is it to get care and affection from your parents?” The answers were on a four-point ordinal scale: “Very hard”; “Somewhat hard”; “Somewhat easy”; and “Very easy”.

Sport participation

Sport participation was measured with the question “How often do you participate in sports (exercise or compete) with a sports team?” There were six optional answers: “Never”; “Less than once a month”; “1-3 times in a month”; “1-2 times in a week”; “3 times in a week”; and “4 times or more often in a week” (Appendices G and H). This variable has shown a protective influence in depression and suicide in youths (Asgeirsdottir et al., 2010; Bjarnason & Thorlindsson, 1994).

Research Design

Analysis of covariance (ANCOVA) was used to observe differences in effect-sizes and significance of the covariates between the groups. ANCOVA measures main-effects of covariates and main- and interaction-effects of the independent variables (IV) on the dependent variables (DV), as well as minimizes the error variance within groups (Field, 2013: p. 578-585). The DV was the standardized scores of the SCL-90 depressed mood inventory. The IV’s were sex and age. Gender differences in both groups were compared with an independent samples t-test. An exploratory factor analysis (EFA) assessed the dimensionality of the subscales.

An important assumption of ANCOVA is the assumption of homogeneity of regression slopes (Miller & Chapman, 2001; Onwuegbuzie, 2000), which was tested with a univariate analysis of variance. The univariate model included main effect analysis of both IV’s and covariates, as well as interaction effects of all covariates with the IV’s. The
assumption of normality was tested with a Kolmogorov-Smirnov test. Homogeneity of variance was assessed with a Levene’s test and standardized residual plots.

**Results**

There were 179 (0.09%) missing cases and 1895 valid cases in the DV for the younger group. Of the adolescents, there were 111 (0.07%) missing cases, whereas 1593 were valid. The assumption of homogeneity of variance was violated in both groups ($p < 0.05$). P-P plots and scatterplots of the standardized residuals in the models confirmed the Levene’s tests (see Appendices I and J). The assumption of homogeneity of regression slopes was met for the adolescents (all interactions $p > 0.05$), but only partially for the younger group. It was not met for parental support, $F(1, 1727) = 5.09$, $p = 0.02$. However, after adjusting for outliers in the data for the younger group, the assumption was met.

Kolmogorov-Smirnov test of normality revealed a deviation of normality in both groups, for the younger group: $D(1895) = 0.142$, $p < 0.001$; and for the adolescents: $D(1593) = 0.083$, $p < 0.001$.

**Factor Analysis**

EFA with principal axis factoring, varimax rotation, and Kaiser normalization was conducted on the subscales. The seven-item scale which was administered to the younger group had one factor with an Eigenvalue over 1.0 which accounted for 41.71% of the variance. Kaiser-Meyer-Olkin (KMO) and Bartlett’s test revealed the adequacy of the scale, $KMO = 0.854$, $\chi^2(21) = 4459.8$, $p < 0.001$. EFA of the 10-item adolescent scale revealed two factors in the rotated solution, the first explaining 25.96% of the variance, and the second 20.67% of the variance, giving a total of 46.63%. Adequacy testing showed $KMO = 0.915$, $\chi^2(45) = 5871.02$, $p < 0.001$.

**Main Results**

An independent samples $t$-test assessed the differences in depressed mood scores
between the genders of both groups. There was a significant difference in depressed mood scores between the genders for pre-pubescent. On average, females had a higher score on the depressed mood inventory ($M = -0.03, SE = 0.03$) than males ($M = -0.19, SE = 0.03$), $t = -4.02, 95\% \text{ CI} (-0.23, -0.08), p < 0.001$. The effect size was $r = 0.14$. There was also a significant difference for the older group, with females having higher depressed mood inventory scores ($M = 0.41, SE = 0.03$) as opposed to males ($M = -0.45, SE = 0.03$), $t = -18.85, 95\% \text{ CI} (-0.94, -0.76), p < 0.001$, with the effect size of $r = 0.43$. Variability in depressive scores between the genders for both groups is visually depicted in Figures 1 and 2. Levene’s test for equality of variances violated the assumption of equal variances in both $t$-tests.

**Children’s ANCOVA results**

Parental monitoring covariate had a significant relationship with depressed mood scores, $F(1, 1661) = 18.41, p < 0.001$, partial $\eta^2 = 0.01$. Parental support also had a significant relationship with depressed mood scores, $F(1, 1661) = 31.01, p < 0.001$, partial $\eta^2 = 0.02$. There was also a significant main effect of the sport participation covariate with SCL-90 scores, $F(1, 1661) = 8.17, p = 0.004$, partial $\eta^2 = 0.01$. However, family structure did not have a significant relationship with SCL-90 scores, $F(1, 1661) = 1.79, p = 0.18$, partial $\eta^2 = 0.001$. Gender had a significant main effect with SCL-90 scores, $F(1, 1661) = 26.13, p < 0.001$, partial $\eta^2 = 0.02$. Age, however, did not have a significant relationship with depressive scores, $F(2, 1661) = 1.26, p = 0.29$, partial $\eta^2 = 0.002$. There was a significant interaction effect between age and sex, $F(2, 1661) = 3.28, p = 0.04$, partial $\eta^2 = 0.004$. The effect size was $r = 0.05$. The interaction effect is depicted in Figure 3.
Figure 1. Standardized SCL-90 scores for depressed mood between genders for the younger group. Percentage of cases is shown on the y-axis, whereas standardized scores of the SCL-90 subscale is shown on the x-axis.

A Bonferroni post-hoc test of one-way ANOVA was conducted to observe any significant differences between the grades. It revealed that there was a marginally significant difference between 5th grade \( (M = -0.10, SE = 0.05) \) and 6th grade \( (M = 0.06, SE = 0.05) \) depressive scores for the females, with mean difference of \(-0.16, 95\% CI (-0.33, 0.003), p = 0.056\). There was not a significant difference between grades for the males. An independent samples t-test observed the differences between the genders in regards to grades. There was not a significant difference in depressive scores between the genders at 5th grade: \( t = -0.64, 95\% CI (-0.17, 0.09), p = 0.52 \). There was a significant difference in depressive scores at 6th grade, with females having higher mean scores as opposed to males \( (M = -0.19, SE = 0.04 \) \).
and $M = 0.06, SE = 0.05$, respectively); $t = -3.70$, 95% CI (-0.39, -0.12), $p < 0.001$. The effect size was $r = 0.15$. There was also a significant difference at 7th grade between the genders ($t = -2.67$, 95% CI (-0.31, -0.05), $p = 0.008$), with females ($M = -0.22, SE = 0.04$) having higher scores than males ($M = -0.04, SE = 0.05$) on average. The effect size was $r = 0.11$.

**Figure 2.** Standardized SCL-90 subscale scores for depressed mood between genders for the adolescents. Percentage of cases is shown on the y-axis. Standardized scores of the SCL-90 subscale is shown on the x-axis.

**Adolescent’s ANCOVA results**

Parental monitoring covariate had a significant relationship with SCL-90 scores, $F(1, 1346) = 6.06, p = 0.014$, partial $\eta^2 = 0.004$. Family structure covariate also had a significant relationship with SCL-90 scores, $F(1, 1346) = 11.26, p = 0.001$, partial $\eta^2 = 0.01$. Sport
participation covariate had a significant main effect with SCL-90 scores, $F(1, 1346) = 11.58, p = 0.001$, partial $\eta^2 = 0.01$. Parental support had a significant relationship as well, $F(1, 1346) = 32.62, p < 0.001$, partial $\eta^2 = 0.02$. Gender had a significant relationship with SCL-90 scores, $F(1, 1430) = 25.59, p < 0.001$, partial $\eta^2 = 0.02$. Age did not have a significant relationship with depressive scores, $F(4, 1346) = 1.97, p = 0.097$, partial $\eta^2 = 0.01$. There was not an interaction effect between age and sex, $F(4, 1346) = 0.41, p = 0.802$, partial $\eta^2 = 0.001$. The direction of influence of the covariates is shown in Table 1. The Beta scores indicate a negative or positive relationship with the dependent variable for both groups.

![Figure 3](image)

*Figure 3.* Interaction effect of age and sex on the DV in the younger group. The y-axis represents the mean z-scores of the SCL-90 subscale. Grades of the participants is categorized on the x-axis. The error bars are at 95% confidence interval.

**Discussion**

The goal of the study was to observe and potentially reveal supplementary data of practical use for preventive policies in youths. The hypothesis that there would be gender
differences in the post-pubertal group was met, with females having higher depressive scores as opposed to males ($M = 0.41$ vs. $M = -0.45$, respectively). However, the hypothesis that the younger group would not differ in depressive scores in regards to sex was rejected. The sex differences did have more effect for the adolescents, with the children having a small effect-size on gender, but medium to large effect size for the older group. Figures 1 and 2 also highlighted the gender differences, emphasizing more variability in depressive scores for the adolescents. The hypothesis that the covariates would have a significant and larger effect post-puberty was not met. For example, parental monitoring had a larger effect size for the children as opposed to adolescents; $r = 0.10$ vs. $r = 0.07$, respectively. This difference in effect might be attributable to the fact that as children age into adolescence, they tend to be more autonomous and independent (Steinberg, 1987), and might not be as dependent on their parent’s as young children.

Table 1

*Parameter estimates of the pre- and post-pubescent covariates, including unstandardized Beta scores ($B$), r-effect sizes, partial $\eta^2$, and 95% confidence intervals.*

<table>
<thead>
<tr>
<th>Covariates</th>
<th>Group</th>
<th>$B$</th>
<th>$r$</th>
<th>partial $\eta^2$</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM</td>
<td>Pre</td>
<td>-0.15</td>
<td>0.10</td>
<td>0.01</td>
<td>***(-0.22, -0.08)</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>-0.08</td>
<td>0.07</td>
<td>0.004</td>
<td>*(−0.15, -0.08)</td>
</tr>
<tr>
<td>FS</td>
<td>Pre</td>
<td>-0.06</td>
<td>0.03</td>
<td>0.001</td>
<td>(-0.15, -0.03)</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>-0.17</td>
<td>0.08</td>
<td>0.01</td>
<td><em><strong>(−0.28, -0.07)</strong></em></td>
</tr>
<tr>
<td>PS</td>
<td>Pre</td>
<td>-0.23</td>
<td>0.14</td>
<td>0.02</td>
<td>***(-0.31, -0.15)</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>-0.22</td>
<td>0.15</td>
<td>0.02</td>
<td>***(-0.30, -0.15) ***</td>
</tr>
<tr>
<td>SP</td>
<td>Pre</td>
<td>-0.04</td>
<td>0.07</td>
<td>0.01</td>
<td><em><strong>(−0.06, -0.01)</strong></em></td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>-0.05</td>
<td>0.09</td>
<td>0.01</td>
<td><em><strong>(−0.07, -0.02)</strong></em></td>
</tr>
</tbody>
</table>

Note. PM = Parental monitoring; FS = Family structure; PS = Parental support; SP = Sport participation; CI = Confidence interval. Pre = Pre-pubescent; Post = Post-pubescent.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

The family structure covariate was not significant for the younger group. However, it was for the adolescents. The relationship of divorce and youth well-being is a complicated
subject. The answer as to why the family structure covariate only had an effect for the post-pubertal group is unknown. It can however be speculated that children of divorced parents are more prone to depression, because mothers of divorced children tend to get depressed after a divorce (Simons, Lin, Gordon, Conger, & Lorenz, 1999). Knowing that depression scores increase in females after age 10, it could be supposed that this effect is most effective at the age of depression-onset. Simons et al. (2009) hypothesised that mother’s depression after a divorce affects their parenting negatively, consequently resulting in a more depressed child. It is hard to generalize this idea on the observed population, since it is impossible to know when the parents of the participants divorced. The hypothesis that age would have an effect for adolescents was not met. However, it was interesting to observe an interaction effect for the children, whereas age did not have an effect. What the interaction effects tells us is that gender has little effect on depressive scores for children in 5th grade. However, 6th grade, or age 11-12, showed an increase on the DV for females, but not males. One might infer that the emerging gender differences of depression are most prominent after the age of 10. Similar findings have been demonstrated in a psychiatric sample (Angold & Rutter, 1992). This information may be useful in preventive policies, emphasizing that females at the observed age show increase in depressive scores, and may need special attention.

Parental support, sport participation, and family structure showed a negative relationship with depressive scores for adolescents, replicating previous findings on the topic (Asgeirsdottir et al., 2010; Sigfusdottir et al., 2004; Wight et al., 2006). Parental monitoring had a negative relationship for the depressive scores in children, replicating Sagrestano et al. (2003) findings. All covariates had a negative relationship with the DV, indicating an increase in the covariate leading to a decrease in the DV. However, it is important to note that the effects of the covariates had small effect on the DV, with partial $\eta^2$ ranging from 0.001 to 0.02. The effect sizes of the variables also had small to medium coefficients, ranging from $r =$
What seemed to have the largest effect on depressive scores was parental support and gender for the pre-pubescents (both \( r = 0.14 \)), but only gender for the post-pubescent group, with \( r = 0.42 \).

What the protective factors seem to have in common is that they are family or home oriented, except for the sport participation factor. The protective effects of sport participation might be attributable to healthy peer relationships or even peer support, which have been observed as protective factors in depression and anxiety (Arora, Fisher, Wheeler, & Barnes, 2017; Yeh et al., 2014. See Epkins & Heckler, 2011 for an extensive review).

The data showed weaknesses. The internal validity of the SCL-90 subscales was tested with EFA, in accordance with Olsen, Jensen, Noerholm, Martiny, & Bech (2003). The depressed mood subscale of the SCL-90 is unidimensional (Derogatis et al., 1976). EFA revealed one factor explaining roughly 42% of the variance for the pre-pubescents. This result supported the unidimensional nature of the SCL-90 subscale. However, the adolescent SCL-90 subscale revealed two factors, making the internal validity of the scale questionable for the older group. Both surveys, however, showed good internal reliability, supporting internal validity.

The face validity of the parental support factor is questionable. The adolescent survey had five questions representing parental support, which were in addition to “Care and affection”: “Conversations about personal issues”, “Advice about education”, “Advice about other subjects”, and “Help with various subjects” (Appendix G). It was therefore inconvenient that only one question on the matter was in the children’s survey. 10 to 13-year-old children might not be able to articulate the concept of, for example, education advice, since they have three to five years of primary school remaining until they choose a secondary school. The exclusion of the questions is understandable, but in return, the validity of the factor is questionable.
Onwuegbuzie (2000) described five primary threats to external validity, which will be observed here: (1) Population validity is how well does the observed sample reflects or mirrors the general population. ICSRA data is unique in a sense that it gathers data from every school in Iceland with a good response rate. (2) Variable specificity may be a threat to the data. As Onwuegbuzie stated: “… the more unique the operationalization of the variables, the less generalizable will be the findings.” (2000). The groups differed in sample size of approximately 300 individuals. But the scores of the SCL-90 subscales were standardized, and therefore controlling for bias in means. (3) Mis-specification error was not of concern, since the variables obtained from ICSRA were the only variables measured. (4) Matching bias is apparent in the study because individuals over 18 were excluded a priori to the main analysis. Finally, (5) matching bias reflects how similar the sample results would be to results from those who did not participate in the study. Again, the ICSRA data, with its large population sample and high response rate, makes this bias a lesser concern.

Three main weaknesses will be outlined as follows: First, the study is cross-sectional, making cause-and-effect inferences impossible. Second, the SCL-90 subscales in both datasets showed good reliability, but the adolescents had a two-factor scale, as opposed to one-factor for the younger group. This might be due to more somatic-related questions in the adolescents’ inventory. Third, not all assumptions were met. Both groups violated the assumption of normality. Both groups also differed in sample size. The sample sizes were initially very equal, but the adolescent data had adults in the sample, which were excluded, therefore shrinking the sample size. The study does yield some strengths. It is unique in the sample itself – it is not common to have access to a sample that reflects the population as well as the ICSRA data. The sample size was quite large, with response rates over 70%. Also, the gender ratio of both samples was very equal.

This study is perhaps the first to observe differences in protective effects on
depression before and after puberty. However, the weaknesses of the study are prominent. The results should be replicated before making any inferences about possible relationships and/or protective elements in depressed mood. Given the importance of youth suicide and depression prevention, research on the topic is very important. The idea of protective factors differing in effect as we age is fascinating, and calls for future longitudinal research on the topic. Preferable way of conducting such a study would to gather surveys from a large population sample such as ICSRA, following the factor effects from 5th grade throughout secondary school. However, it would require participant identification or participation number to observe any causal relationships.

In conclusion, this study found that pre-pubescent children and post-pubescent adolescents share significance of the same protective factors on depressive scores, except for family structure, which doesn’t seem to have a significant effect before puberty. It also revealed an interaction effect of age and sex in the pre-pubescent group. Figure 3 highlighted the trend in gender differences at 6th grade. These results need replication before applicability can be considered. Studies on depression in youths and protective processes influencing depression are important to formulate effective prevention protocols. The present study suggests that more exposure of protective factors have a negative effect on depressed mood, and could therefore be beneficial to children and adolescents. It is, however, unknown whether some of the protective factors observed have a different effect on youths at emerging pubescence. It would also be beneficial to know whether some of these factors have an effect after controlling for puberty or hormonal status. Angold & Rutter (1992), for example, found that pubertal status had no effect on depression when controlling for age. These topics are promising in the field of developmental and health psychology, and deserve more attention, for the youth.
References


Appendix A

Informed Consent Letter for Parents of Pre-Pubescent Children

PROTECTIVE FACTORS ON YOUTH DEPRESSION 26

RANNÓKNI & GREINING
Háskólanum í Reykjavík

Reykjavík 23. janúar 2015

Ungt fólk 2015

Rannsókn meðal nemenda í 5. – 10. bekk á Íslandi.

Ágætu foreldrar í forræðamein,


Nemendur í 8. – 10. bekk svara aftur á móti nokkur spurningum um vínuvefnareyxlun nemenda. Sú könnun tekr aðeins um 10 minútur.

Ungt fólk rannsóknaraldirn hefur verið uninn á Íslandi allt frá árinu 1992 en samfella í rannsóknun á högum og líðan ungs fólks er þessi sem að móðurkinnar svarfa eftir mikilvægi. Upplysingar úr rannsóknunum hefur allt frá upphafi verið notaðar við stefnumótun og aðgerðar í mælum ungs fólks og eru grunnur að vinnu tómargra stofnara samfélagsins, sem vinna að því að þæta líf og hagi ungs fólks á Íslandi.

Megináherskur rannsóknanna Ungt fólk eru þess samsu í ár og áður hefur verið og líta að því að kanna og líðan ungmenna og félagslega þeirra. Hér má m.a. nefna lengst við foreldra og víni, þrött og þöfnstundir, félagslif líðan, einhellig, stjöl, móxará, nám, brottabl arranged, félagslega stóðu, svefnverjun, leistung, tilvøndukun, vínumælareyxlun, framlöðarafæri og annað mikilvægt.

Könnun er nafnlaus og því ekki heigt að reikja neinir uppgýsingar til einstaklinga og eru nemendur sérstaklega bedrít að rita hverki nafni sitt ne kennislög á spurningalistiði.

Pegar nemendur hafa leikið við að fylla út spurningalistan eru þeir bedrít að setja þá í þrunðarumslag og leka þeim vandiðlega áður en þeim er sanðan saman. Lístarnir eru svi sendir greiningarafailum sem tölvust sambandi uppgýsingarar án þess að geta með nokkrum móti vitað hverjum þeir tilhægra. Ólíg rannsóknarinnar eru opsemiðurkeið, að skráningu íkkin er spurningalistunum ytti.


Ef þannar uppgýsinga er óskað þá viðinsamlega hafði sambandi við Jón Sigfússon hjá Rannsóknun & greiningu með tölvupost rannsoknir@rannsoknir.is eða í síma 599 6431.

Með vinsemund og virðingu
Starsfólk Rannsóknar & Greiningar
Appendix B

Informed Consent Letter for the Parents of Post-Pubescent Adolescents

RANNSÓKNIR & GREINING
Háskólanum í Reykjavík

Reykjavík 10. október 2016

Ágætu foreldrar / forðbamen,


Kvennum lýnu sem fyrir að því að kvenna hljósum og ljósum unga miðja, felagslega þettur svo sem tengtur við foreldra og vinn, þorrutæki og þrótum, felagslegir, liðin, einfel, vimtunavöldum, streitum, maturæfi, nán, brotfólksaður, felagslega stóðu, sveni, leistur, undlega og líkamlega liðin, lesturfræðilegra, þólvumökum, viðhork við framhaldsskólum og þeirra sem nytjist til að sela þekkingum um, og þaurt hljósum og liðin þesss aðskuldshöps.

Kvennum er með öllum næðisum og unni samkvæmt regnum um persónumvernd. Þannig er ekki hægt að ráðja neð svör til einstaklinga. Þegar nemendur hafa lokid við sýna þetta á því að þurfa orði við og þóta þeim vandlega. Listannir eru svo sendir greiningarleiki sem skrá upplysingarnar ún þess að gera með nokkrum meðrit við það hvennum þær tilheyrur. Að skráningu þakum er það grundlegi einum eftir.

Samkvæmt verjum upplysingum við foreldra og forðbamenum um fyrirlægnum og getum þeim kóst á því að ekki elfi að bora þeim taki ekki þást. Þannig er nemendum sjálfrum heimilt að skróa ekki þátt í þessum spurningum ef þau svo kjósa. Þjósu foreldrar / forðbamenum að born þeirra taki ekki þást er best að hafa samband við Rannsóknir og greiningu eða viðkoman skóla og láta vita. Verði þátttak göð koma upplysingarnar til með að skila mikilsverðum niðurköllum, þæði hagnýtum og fræðilegum líkt og fyrri kvenna af þessu tagi hafa gert.

Ef nánari upplysinga er öskð þá vinsamlega hafið samband við starfshljósum Rannsókna & greiningar með tölvupostunum rannsoknir@rannsoknir.is eða í samei 399 6431.

Með vinsend og virðingi
Starfshljósum Rannsókna & greiningar
Appendix C

Demographic Questions in the Pre-Pubescent Questionnaire

1. Ert þú strákur eða stelpa?
   □ Strákur   □ Stelpa

2. Í hvaða bekk ert þú?
   □ 5. bekk
   □ 6. bekk
   □ 7. bekk
Appendix D

Demographic Questions in the Post-Pubescent Questionnaire

1. Ert þú strákur eða stelpa?
   □ Strákur  □ Stelpa

2. Hvaða ár e rt þ ú fædd(ur)?
   □ 2001  □ 2002  □ Annað, árið ________________
PROTECTIVE FACTORS ON YOUTH DEPRESSION

Appendix E

SCL-90 Depression Subscale for Pre-Pubescents

46. Hefur þú fundið fyrir einhverju af þessu hér að neðan síðustu sjö daga? (Merktu í einn reit í hverjum lið).

<table>
<thead>
<tr>
<th></th>
<th>Aldrei</th>
<th>Næstum</th>
<th>Sjaldan</th>
<th>Stundum</th>
<th>Oft</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>aldrei</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Þú varst leiður eða hafðir</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>litinn áhuga á að gera hluti ...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Þú hafðir litla matarlyst</td>
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<tr>
<td></td>
<td>........</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Þér fannst þú einmana</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>........</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Þú grést auðveldlega eða</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>langaði til að gráta.............</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Þú áttir erfitt með að</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>sofna eða sofá..................</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Höfuðverk....................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) Magaverk....................</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SCL-90 Subscale for Post-Pubescent Adolescents

### 30. Hversu oft vart þú var/vör við eftirfarandi vanlýðan eða óþægindi sérastlíðna viku? Merktu í EINN réit í hverjum lið.

<table>
<thead>
<tr>
<th></th>
<th>Nar aldrei</th>
<th>Spaldan</th>
<th>Sundan</th>
<th>Öft</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Höfuðverk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Verkið í maga</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Tangaóstyrk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Skyndilega hræðslu án nokkurra ástaðu</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Þú varst spennt/ur</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) Þú varst leið/ur eða hafðir litinn áhuga á að gera hluti</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g) Þú hafðir litla maturlyst</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h) Þér fannst þú einmana</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Þú grést auðveidilega eða langaði til að gráta</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>j) Þú áttir erfitt með að sofnu eða hálfa þér sofandi</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix G

Protective Factors in the Pre-Pubescent Questionnaire

4. Hverjir búa heima hjá þér? (Merktu aðeins í EINN reit)

☐ Ég bí hjá báðum foreldrum mínun
☐ Ég bí nokkurn veginn jaft til skiptis hjá pabba og mömmu
☐ Ég bí aðallega hjá mömmu en ekki pabba
☐ Ég bí aðallega hjá pabba en ekki mömmu
☐ Ég bí hjá mömmu og sambýlismanni/sambýliskonu hennar
☐ Ég bí hjá pabba og sambýliskonu/sambýlismanni hans
☐ Ég bí hjá óðrum en mömmu og pabba

9. Hversu auðvelt eða erfitt er fyrir þig að fá umhyggju og hlýju hjá foreldrum þinum? (Merktu í einn reit)

<table>
<thead>
<tr>
<th>Mjög</th>
<th>Frekar erfitt</th>
<th>Frekar auðvelt</th>
<th>Mjög auðvelt</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

10. Hversu vel eiga eftirfarandi fullyrðingar við um þig? (Merktu í einn reit í hverjum lið)

<table>
<thead>
<tr>
<th>a) Foreldrar minir þekkja vini/vinkonur mína(r)</th>
<th>Á mjög vel við um mig</th>
<th>Á frekar vel við um mig</th>
<th>Á frekar illa við um mig</th>
<th>Á mjög illa við um mig</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b) Foreldrar minir þekkja foreldra vina/vinkvenna mínna</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

35. Hversu oft æfir þú íþróttir (æfir eða keppir) með íþróttafélagi? (Merktu aðeins í einn reit)

☐ Aldrei
☐ Sjáldnar en einu sinni í mánuði
☐ 1-3 sinnum í mánuði
☐ 1-2 sinnum í viku
☐ 3 sinnum í viku
☐ 4 sinnum í viku eða oftar
Appendix H

Protective Factors in the Post-Pubescent Questionnaire

7. **Hverjir eftirtalinna búa heima hjá þér?** Merktu aðeins í EINN reit.

- [ ] Báðir foreldrar mínir
- [ ] Ég bó nokkurn veginn til skiptis hjá pabba og mómmu
- [ ] Móðir mín en ekki faðir minn
- [ ] Faðir minn en ekki móðir mín
- [ ] Móðir mín og sambŷlismaður/sambýliskona hennar
- [ ] Faðir minn og sambýliskona/sambŷlismaður hans
- [ ] Ég bó á eigin vegum
- [ ] Ég bó með vini/vinkonu/félagu
- [ ] Ég bó hjá óðrum ættingjum
- [ ] Annað fyrirkomulag

26. **Hversu auðvelt eða erfitt væri fyrir þig að fá eftirtalið hjá FORELDRUM þínun?** Merktu í EINN reit í HVERJUM lið.

<table>
<thead>
<tr>
<th></th>
<th>Mjög erfitt</th>
<th>Frekar erfitt</th>
<th>Frekar auðvelt</th>
<th>Mjög auðvelt</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Umhyggju og hlýju</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>b) Samræður um persónuleg málefni</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>c) Ráðleggingar vörlandi námíð</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>d) Ráðleggingar varðandi önnur verk (viðfangsefin) þín</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>e) Áðstoð við ýmis verk</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>
28. **Hversu vel eiga eftirfarandi fullryðingar við um þig?** Merktu í EINN reit í HVERJUM lið.

<table>
<thead>
<tr>
<th></th>
<th>Æ mjög alla við um mig</th>
<th>Æ frækri alla við um mig</th>
<th>Æ frækri vel við um mig</th>
<th>Æ mjög vel við um mig</th>
<th>By ekki hjá foreldrum</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Fóruldr minir fylgjast með því með hverjum ég er á kvöldin</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b) Fóruldr minir fylgjast með því hvar ég er á kvöldin</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>c) Fóruldr minir þekkja vini/vinkonur mín(í)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>d) Fóruldr minir þekkja foreldra vina/vinkvenna mínna</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
</tbody>
</table>

71. **Eftirfarandi spurningar eru um íþróttir og líkamsrékt.** Merktu í EINN reit í HVERJUM lið.

<table>
<thead>
<tr>
<th></th>
<th>Nær áaldrei</th>
<th>1 sinn í viku</th>
<th>2 sinnum í víku</th>
<th>3 sinnum í víku</th>
<th>4-6 sinnum í víku</th>
<th>Svø til á hverjum degi</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Hve oft tekur þú þátt í íþróttum og líkamsþjálfinu í skólanum fyrir utan skyldutíma (eða limitíma)?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b) Hve oft stundar þú íþróttir (eða keppir) með íþróttafélaga?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>c) Hve oft stundar þú íþróttir eða æfingar; hvor ekki á veigum skólanu í íþróttafélaga?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>d) Hve oft reynir þú á þig meðist verulega eða svínir?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
Appendix I

P-P Plot and Scatterplot of the Standardized Residuals in the Pre-Pubescent Model
Appendix J

P-P Plot and Scatterplot of the Standardized Residuals in the Post-Pubescent Model

Normal P-P Plot of Regression Standardized Residual

Scatterplot

Regression Standardized Residual

Regression Standardized Predicted Value