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ORIGINAL ARTICLE

Latent Profiles of Perceived Parental Psychopathology: Associations with Emerging Adult Psychological Problems

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Abstract

The understanding of the complex relations between parent and child psychopathology would be enhanced if common patterns of parental problem types or particular parent dyads were identified. The current study used latent profile analysis to allow for a person-centered approach to the examination of which parental psychopathology subgroups based on their perceived depressive, anxiety, and antisocial problems are both most common and most strongly associated with emerging adult psychopathology. Participants included 2204 emerging adults enrolled in a Southern United States university who reported on their perceptions of their parents' and their own current psychological problems. A 5-profile solution for perceived parental psychopathology was identified and represented anticipated groups (e.g., low problems, high problems, high internalizing only, high externalizing only). The largest effects of these profiles were found for emerging adult antisocial problems, and paternal profiles demonstrated larger effect sizes relative to maternal profiles. When both parents were perceived as having elevated problems, emerging adults also generally reported the highest rates of their own psychological problems. Results also suggest that perceiving as having low problems may protect against the negative effects of the other parent's antisocial problems or depressive/anxiety problems, but may not be sufficient when a parent has elevated problems across domains. Findings indicate the importance of considering varying levels of psychopathology.

Keywords Parent · Emerging Adult · Gender · Psychopathology · Dyads

Introduction

A significant amount of research to date has suggested strong associations between parent and child psychopathology [28, 31, 34; Marmorstein et al. 31; Matsuzaka et al. 34]. This work indicates that both biological/genetic [25] and environmental factors (e.g., modeling of maladaptive coping behaviors or negative perceptions of caregivers; Weems and Costa [52], Fisak and Griss-Tacqeuchel 19; Walker and McKinney [50]) explain some of the variance in the association between parent and child psychopathology.

In addition to biological and general environmental factors, the types of problems children develop (e.g., externalizing, internalizing, or both) may vary as a function of the parents' specific type of psychopathology. For example, the effects of maternal depression on children have been well examined, suggesting that children of depressed mothers were at greater risk for internalizing problems. Other research has indicated that such children were at greater risk for social and externalizing problems as well as poor response to treatment [10, 16, 45]. Further, mothers who were depressed were more likely to pair with fathers who were antisocial, which exacerbated a negative environment for children [31]. For parental anxiety, some evidence has suggested that parent anxiety yields disorder-specific outcomes in youth (i.e., anxiety disorders), whereas other evidence has indicated that parent anxiety puts children at greater risk for depressive and externalizing problems [2, 41]. Just as much research has suggested a range of problems associated with parental depression (e.g., Goodman and Gotlib [24]; Reinherz et al. [45]), other evidence has indicated that parental anxiety can be equally or more detrimental [3]. Moreover, parental anxiety has been associated with parent–child conflict, which in turn was directly associated with child anxiety [23].

Parental antisocial behavior also produces negative outcomes in youth, broadly including both internalizing and

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externalizing problems [4, 27]. Research has suggested the importance of the presence or absence of both mothers' and fathers' antisocial problems for child problems; for example, whether children develop antisocial problems in the context of being exposed to paternal antisocial problems also may depend on the presence of maternal problems [17]. Further, prior evidence has indicated that although parental internalizing problems may not have a strong association with the quality of parent–child relationships, parental externalizing problems may be more strongly related to poor parent–child relationships [20]. Given that parent–child relationships have a long-term impact on children's social and emotional functioning [14], parent externalizing problems, such as antisocial behavior, warrant more attention.

According to multifinality theory [6], a single risk factor (e.g., a parent with depression or antisocial behavior) can produce a host of problems in youth. Therefore, it is important to consider how multiple types of parental psychopathology combinations and patterns of psychopathology between parent dyads impact children, particularly beyond childhood. Rather than examining "pure" parental antisocial problems or "pure" parental depressive problems as predictors, the understanding of the complex relations between parent and child psychopathology would be enhanced if particular parent dyads (e.g., mother with antisocial behavior alongside father with anxiety) or common patterns of parent problem types (e.g., mothers with high anxiety and low antisocial behavior or vice versa) were identified as the most robust predictors of child problems.

Gender Differences

In addition to variation of parental symptom presentations producing differential child outcomes, it also is important to consider that the effects of parental psychopathology on child outcomes varies as a function of parent and child gender. Research has suggested that mothers and fathers have differential relationships with their sons and daughters, and this leads to differential influences [20, 29, 36, 39]. For example, Ohannessian et al. (44) found that paternal but not maternal psychopathology was strongly related to adolescent alcohol use. McKinney and Milone [38] found that whereas maternal and paternal psychopathology strongly predicted child psychopathology, mediators of this pathway were significant for mothers but not fathers, suggesting that these relations are distinct between mothers and fathers. Relatedly, mothers with a particular psychological problem may express or exhibit their pathology differently than fathers with the same diagnosis. For example, mothers who are depressed may speak less, be slower in responsiveness, and respond more negatively or critically to their children [13], whereas fathers' depressive symptoms may be associated more with reduced amounts of positive interactions, such as less warmth and more psychological control [11].

Recent evidence has indicated that sons may be particularly impacted by their parents' psychopathology, particularly their mothers'. For example, Franz and McKinney [20] suggested that emerging adult male children may feel closer to their parents who exhibit internalizing problems (e.g., try to provide their parents with support), and perhaps as a result were at greater risk for transmission of psychopathology. On the other hand, their results suggested that daughters may grow more distant from their parents with internalizing problems, which may in turn reduce transmission of parent to child psychopathology. Although these findings clearly emphasize the importance of considering parent and child psychopathology relations in the context of gender, future research examining the effects of varying parent pairs (e.g., mother with psychopathology and father without, father with and mother without, both parents with psychopathology), and groupings of symptomology (e.g., mother with antisocial behavior and father with internalizing problems, mother with externalizing and internalizing problems and father without psychopathology) would shed further light on the complexities of the associations between parent and child psychopathology.

Latent Profile Analysis

Latent profile analysis (LPA) allows for a person-centered or individualized approach to examining which subgroups (in this case parental psychopathology) are best associated with outcomes, such as emerging adult psychopathology. LPA uses continuous scores to identify groups of participants based on associations between variables (e.g., parental psychopathology types), which are similar within groups and different between groups. Specifically, LPA allows for identifying which parental psychopathology types are most common in the sample. Using multiple indicators of mother-father and parent–child psychopathology problems allows for identification of classes of dyads that may be distinguished by their ability to predict emerging adult psychopathology.

The Current Study

It appears that prior research has not been conducted that has specifically used LPA with parental psychopathology in predicting emerging adult psychopathology, despite the strong rationale for doing so as discussed above. The current study used LPA to identify groups of mothers and fathers based on their depressive, anxiety, and antisocial problems (i.e., the current study focused on the most commonly researched problems to improve both possible impact and parsimony) as perceived by emerging adults, and associated those groups

with emerging adult psychological problems (i.e., depressive, anxiety, and antisocial problems). This method aids the field in determining which types of parental psychopathology patterns exist (e.g., high depressive/anxiety, low antisocial group; high antisocial, low depressive/anxiety) and which groups share the most robust associations with emerging adult psychological problems.

Thus, the current study aimed to identify the most problematic combinations of mother-father and parent–child dyads. For example, prior research has found that mothers who were depressed paired with fathers who were antisocial were both relatively common and highly impactful on children's problems [31]; however, less is known about other dyad types (e.g., mothers who are antisocial, fathers who are depressed). Further, research has suggested that differences in child outcomes in children with two versus one parent with psychopathology may vary as a function of the type as well as severity of the problem. However, evidence has indicated that children with two affected parents, relative to one, were more likely to have more severe psychological problems [30]. Further research is warranted and should examine how subgroups of two parents who each exhibit psychopathology may differ from subgroups comprised of one parent exhibiting a range of problems as well as one parent who exhibits mild to no problems. Overall, more advanced analyses like LPA that identify various patterns of parental psychopathology and problematic dyads within these patterns will shed further light in the understanding of the development of psychopathology.

To be clear, the current study utilized emerging adult reports of their parents' as well as their own psychological problems. It is important to note that perceptions of parents have been frequently and consistently found to have important associations with child outcomes. For example, McKinney and Kwan [37] found that emerging adults' perceptions as well as preferences for parenting styles predicted their psychological functioning, Yahav [49] demonstrated the importance of child perceptions when examining parental factors, and Finley, Mira, and Schwartz [18] suggested that emerging adults are freer to rate their parents more accurately given that they are more independent than younger children.

Hypothesis 1 stated that perceived maternal as well as perceived paternal profiles would be identified as having (1) low depressive, anxiety, and antisocial problems, (2) high depressive, anxiety, and antisocial problems, (3) high depressive and anxiety problems alongside low antisocial problems, and (4) low depressive and anxiety problems alongside high antisocial problems. Hypothesis 2 stated that the identified perceived maternal and paternal profiles would be associated with emerging adult depressive, anxiety, and antisocial problems. Hypothesis 3 stated that the interaction of perceived maternal and paternal profiles would be associated with emerging adult psychological problems, such that two parents with psychological problems would be associated with higher emerging adult psychological problems relative to one or no parents. Hypothesis 4 stated that this interaction would be stronger in males relative to females, given findings by Franz and McKinney [20] that males, compared to females, reported stronger associations with parental psychopathology.

Method

Participants

Participants included 2204 emerging adults (65.3% female; 71.7% Caucasian, 22.9% African American, 1.6% Latino, 1.6% Asian, 2.0% Other) aged 18–25 years ($M = 19.14$; $SD = 1.35$) who were enrolled in a Southern United States university. Reported parental education varied based on highest degree obtained as follows: 25.8% of mothers and 36.9% of fathers reportedly had a high school education or less, 51.7% of mothers and 41.1% of fathers had an undergraduate degree, and 22.6% of mothers and 22.0% of fathers had a graduate degree. Participants reported on their biological mothers (95.8%) and biological fathers (74.5%) or stepfathers (16.0%) in the majority of cases, with smaller groups of participants reporting on their adoptive or foster parents (< 2% total). Participants reported an average of 1.68 ($SD = 0.88$) and 1.28 ($SD = 0.61$) weekly contact hours with their mother and father figures, respectively.

Procedure

All study procedures were approved by the authors' institutional review board (IRB) and were carried out in accordance with the American Psychological Association Code of Ethics. Participants came from an online participant pool in a psychological research program at a university. An informed consent form was presented first to participants, who were instructed to complete questionnaires with respect to current perceptions. Participants were given a printable debriefing form and research credit upon their completion of or voluntary withdrawal from the study.

Measures

Parental and Emerging Adult Psychological Problems

The Adult Behavior Checklist (ABCL) and Adult Self Report (ASR; Rescorla and Achenbach [46]) were used to measure emerging adults' perceptions of their own as well as maternal and paternal depressive, anxiety, and antisocial problems. These measures are parallel forms (i.e., the

ABCL is used to rate others and the ASR is used to rate the self) and include 123 items scored using responses ranging from *not true* to *very true or often true*. The ABCL and ASR have DSM-oriented subscales including depressive problems, anxiety problems, somatic problems, inattention problems, hyperactivity problems, social avoidant problems, and antisocial personality problems, three of which were used to assess maternal and paternal depressive (e.g., *my mother/father is unhappy, sad, or depressed*), anxiety (e.g., *my mother/father worries a lot*), and antisocial problems (e.g., *my mother/father blames others for their problems*). The ABCL and ASR have demonstrated good psychometrics overall, and the ABCL a valid tool when used to report on others' behaviors as long as rater is familiar with the ratee (e.g., children rating their parents; Rescorla and Achenbach [46]).

Planned Analyses

Consistent with Costa et al. (9), AMOS 24.0 was used to conduct Bayesian LPA with Markov Chain Monte Carlo (MCMC) simulation to identify distinct latent profiles of perceived maternal and paternal psychological problems separately, based on emerging adult perceptions of maternal and paternal depressive, anxiety, and antisocial problems. LPA identifies distinct latent profiles based on observed continuous variables [42]. Solutions were tested using approximately 55,500 samples and were compared against theory as well as all fit indices provided by AMOS, including Gelman et al. [22] convergence criterion of <1.10 and posterior predictive p value of 0.50 as well as Nagin's (43) criterion of posterior probabilities of correct class assignment >0.70.

Maternal and paternal profile membership, which was fixed at classification probabilities logits to account for uncertainty in profile membership, and participant gender were used in a 5 (maternal profile membership) $\times$ 5 (paternal profile membership) $\times$ 2 (participant gender) MANCOVA to predict emerging adult depressive, anxiety, and antisocial problems using race, family household structure, and parental education as covariates. Partial η^2 served as the measure of effect size, where values of 0.01–0.04, 0.04–0.14, and greater than 0.14 are considered small, medium, and large, respectively [8].

Results

Table 1 displays descriptive statistics and alphas for perceived maternal, paternal, and emerging adult depressive, anxiety, and antisocial problems. Although mean scores across scales fell within normal ranges of problem behaviors according to the ASR and ABCL, variability in scores is present as a significant portion of ratings fell within borderline ($T \geq 65$) and clinical ($T \geq 70$) risk ranges [46]. For example, emerging adult ratings of themselves and their parents fell in the clinical range 3.8–7.0% of the time for depressive problems, 3.1–4.1% of the time for anxiety problems, and 11.0–19.1% of the time for antisocial problems. Thus, the current study's sample reflects a range of problem behaviors across depressive, anxiety, and antisocial problems when participants rated their mothers and fathers as well as themselves.

Table 1 Descriptive statistics and alphas

	M(*SD*)	α	% $T>65$ Borderline	% $T>70$ Clinical
Maternal				
Depressive problem	4.63 (5.29)	0.87	17.1%	7.0%
Anxiety problems	4.14 (2.85)	0.82	7.0%	4.1%
Antisocial problems	5.38 (7.24)	0.89	22.9%	19.1%
Paternal				
Depressive problem	3.83 (4.89)	0.86	14.8%	5.0%
Anxiety problems	3.30 (2.58)	0.79	6.0%	3.1%
Antisocial problems	5.83 (7.27)	0.92	21.9%	14.7%
Emerging adult female				
Depressive problem	5.38 (4.76)	0.88	13.9%	4.7%
Anxiety problems	5.09 (3.13)	0.81	5.7%	3.2%
Antisocial problems	5.09 (5.88)	0.91	14.4%	11.5%
Emerging adult male				
Depressive problem	5.09 (4.79)	0.86	15.8%	3.8%
Anxiety problems	4.46 (2.81)	0.80	6.0%	3.4%
Antisocial problems	6.78 (6.78)	0.92	18.8%	11.0%

Latent Profile Analysis

The hypothesized 4-profile solution (i.e., parent with high depressive/anxiety problems and low antisocial problems, parent with low depressive/anxiety problems and high antisocial problems, parent high on all three problem scales, parent low on all three problem scales) was not identified by the 4-profile maternal or paternal LPA. Instead, the 4-profile solutions identified mothers and fathers (1) low across the three problem scales, (2) high across the three problem scales, (3) mild elevations across the problem 3 scales, and (4) high in antisocial problems and low in depressive/anxiety problems. Importantly, the 4-profile solutions did not represent mothers and fathers high in depressive/anxiety problems and low in antisocial problems as hypothesized; however, these groups are theoretically expected to exist and have been empirically observed in other research (i.e., parents with high internalizing but low externalizing problems exist).

Given that the 4-profile solution was not consistent with theory and empirical observations, a 5-profile solution was

tested and produced the hypothesized groups as well as a group that had mild elevations across the three scales (i.e., similar to the 4-profile solution but producing the hypothesized profiles with high depressive/anxiety and low antisocial problems). Thus, these 5-profile solutions for perceived maternal and paternal variables were determined to be most consistent with theory. Both the maternal and paternal 5-profile solutions had convergence statistics ≤ 1.0004 (i.e., the solutions provided excellent fit) and posterior predictive probability = 0.55 (i.e., the solutions are highly likely to be reproduced upon resampling). These solutions had average posterior probabilities for most likely profile membership ranging between 0.84 and 0.99, suggesting good classification accuracy and exceeding Nagin's ([43]) criterion of 0.70.

Table 2 and Fig. 1 show the 5 profiles for maternal and paternal variables. The (1) parent with low problems profiles (maternal $N = 1317$, 57%; paternal $N = 1349$, 58%) may be described as mothers and fathers who were reported as having very low depressive, anxiety, and antisocial problems (i.e., all $T \leq 52$). The (2) parent with mild problems profiles (maternal $N = 436$, 20%; paternal $N = 373$, 18%) may be described as mothers and fathers who were reported as having some depressive, anxiety, and antisocial problems but these scores happened to fall between $T = 56$ and 59 across all three scales according to the ABCL standardization

Table 2 Maternal and paternal psychological problem profiles descriptive statistics

	Low problems M(SD)	Mild problems M(SD)	Elevated problems M(SD)	Elevated antisocial problems M(SD)	Elevated depressive/anexiety problems M(SD)
Depressive problems					
Maternal	1.21 (1.39)	5.44 (1.98)	14.82 (3.18)	8.25 (2.82)	13.84 (2.93)
Paternal	0.88 (1.16)	3.77 (1.56)	13.87 (2.68)	4.59 (2.45)	9.71 (2.26)
Anxiety problems					
Maternal	2.54 (1.96)	6.09 (2.22)	6.97 (2.07)	5.12 (2.25)	8.01 (2.54)
Paternal	1.84 (1.56)	4.96 (1.91)	6.57 (1.98)	3.39 (2.42)	5.73 (2.20)
Antisocial problems					
Maternal	1.33 (1.75)	4.50 (2.56)	21.35 (4.37)	13.54 (2.98)	6.49 (2.93)
Paternal	1.70 (2.17)	5.13 (2.71)	20.51 (4.24)	16.90 (4.21)	8.44 (3.90)

Minimum for all scales = 0. Depressive Problems Maximum = 26, Anxiety Problems Maximum = 14, Antisocial Problems Maximum = 40. Low Problems $N = 1331$ for maternal, 1360 for paternal; Mild Problems $N = 442$ for maternal, 376 for paternal; Elevated Problems $N = 291$ for maternal, for 313 paternal; Elevated Antisocial Problems $N = 125$ for maternal, 77 for paternal; Elevated Depressive/Anxiety Problems $N = 81$ for maternal, for 136 paternal

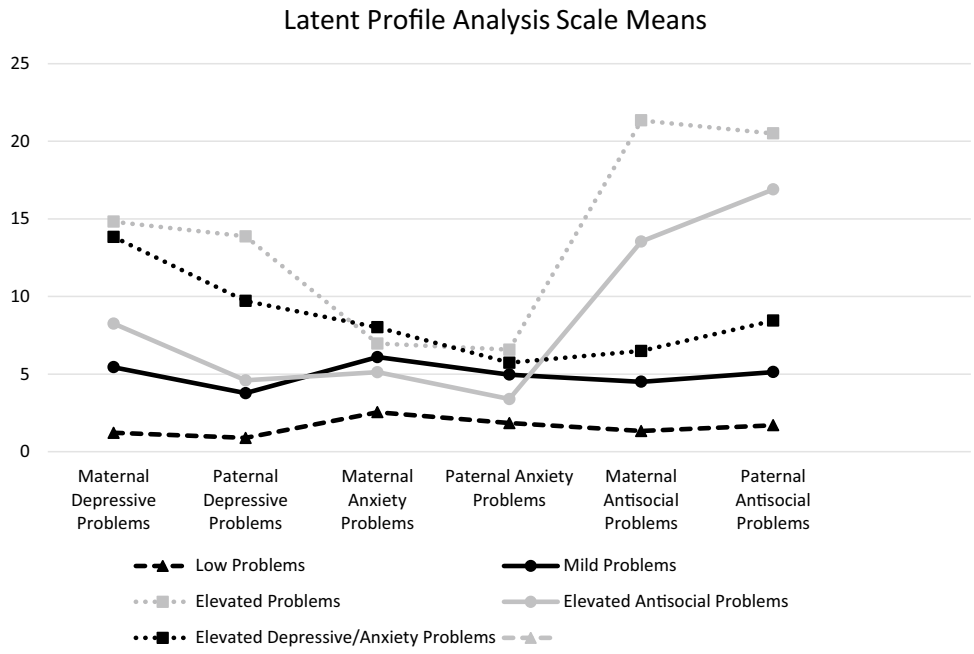

Fig. 1 Graphical representation of Table 1 means for maternal and paternal profiles. Depressive problems maximum = 26, Anxiety problems maximum = 14, antisocial problems maximum = 40

sample (i.e., in the normal range; Rescorla and Achenbach [46]). The (3) parent with elevated problems profiles (maternal $N = 285$, 13%; paternal $N = 373$, 14%) may be described as mothers and fathers who were reported as having high amounts of depressive, anxiety, and antisocial problems; these groups happened to have $T \geq 70$ for depressive and antisocial problems (i.e., in the clinical risk range) and ≥ 65 (i.e., in the borderline risk range) for anxiety problems. Although it would have been ideal for anxiety problems to be in the clinical range, the LPA did not produce such profiles. The (4) parent with elevated antisocial problems only profiles (maternal $N = 122$, 6%; paternal $N = 77$, 4%) may be described as mothers and fathers who were reported as having high antisocial problems (i.e., $T \geq 70$) but fewer depressive and anxiety problems (i.e., $T < 65$). Again, it would have been ideal for these profiles to be $T < 60$ for depressive and anxiety problems, however, the LPA did not produce such profiles. The (5) parent with elevated depressive and anxiety problems only profiles (maternal $N = 81$, 4%; paternal $N = 131$, 6%) may be described as mothers and fathers who were reported as having high depressive and anxiety problems (i.e., $T \geq 65$) and fewer antisocial problems (i.e., $T < 65$).

MANCOVA

Multivariate Effects

Results of the MANCOVA using the maternal and paternal psychological problems profiles as well as participant gender to predict emerging adult depressive, anxiety, and antisocial problems are shown in Table 3 and Figs. 2 and 3. All effects reported are considered significant at $p < 0.01$ unless otherwise specified. Race, family household structure, and parental education were not significant covariates. Significant multivariate effects included maternal profile, Wilks' $\lambda = 0.888$, $F(12, 2188) = 22.10$, partial $\eta^2 = 0.039$; paternal profile, Wilks' $\lambda = 0.879$, $F(12, 2188) = 24.12$, partial $\eta^2 = 0.042$; and gender, Wilks' $\lambda = 0.977$, $F(3, 2186) = 16.93$, partial $\eta^2 = 0.023$. The two-way multivariate interactions with gender were not significant; the two-way interaction between maternal and paternal profile was significant, Wilks' $\lambda = 0.958$, $F(16, 2188) = 1.96$, partial $\eta^2 = 0.014$; and the three-way interaction (i.e., maternal profile × paternal profile × gender) also was significant, Wilks' $\lambda = 0.964$, $F(48, 2188) = 1.66$, partial $\eta^2 = 0.012$. Univariate effects for these significant multivariate effects are shown in Table 3

Table 3 Effects of 5 (maternal profile) × 5 (paternal Profile) × 2 (gender) MANCOVA

Problem scale	F	Partial η^2	M(SE) Females	M(SE) Males	M(SE)	M(SE)	M(SE)
Gender effects							
EA depressive	9.76	0.004	7.85(0.20)	6.78(0.28)			
EA anxiety	22.63	0.010	6.64(0.15)	5.46(0.20)			
EA antisocial	8.06	0.004	7.84(0.23)	8.96(0.32)			
			Low problems	Mild problems	Elevated problems	Elevated antisocial problems	Elevated Depressive/anxiety problems
Maternal profile effects							
EA depressive	20.31	0.036	5.09(0.29)	6.61(0.26)	8.99(0.39)	7.26(0.40)	8.64(0.52)
EA anxiety	10.44	0.019	5.05(0.21)	6.53(0.19)	6.56(0.28)	5.34(0.29)	6.78(0.37)
EA antisocial	52.03	0.087	5.42(0.33)	6.26(0.30)	12.66(0.45)	9.61(0.46)	8.05(0.60)
Paternal profile effects							
EA depressive	37.92	0.065	4.61(0.32)	6.51(0.30)	10.07(0.34)	7.23(0.52)	8.17(0.39)
EA anxiety	12.74	0.023	4.55(0.23)	6.06(0.22)	6.60(0.24)	6.53(0.38)	6.52(0.28)
EA antisocial	62.98	0.103	4.46(0.37)	7.06(0.35)	12.68(0.39)	9.11(0.60)	8.69(0.45)
Maternal profile × paternal profile effects							
EA depressive	2.32	0.017	See Fig. 2				
EA anxiety	ns	–					
EA antisocial	3.16	0.023					
Maternal profile × paternal profile × gender effects							
EA depressive	ns	–	See Fig. 3				
EA anxiety	ns	–					
EA antisocial	2.42	0.017					

Univariate $F(5, 571)$ effects significant at $p < 0.01$. Minimum for all scales = 0. Depressive problems maximum = 26, anxiety problems maximum = 14, antisocial problems maximum = 40. EA = emerging adult

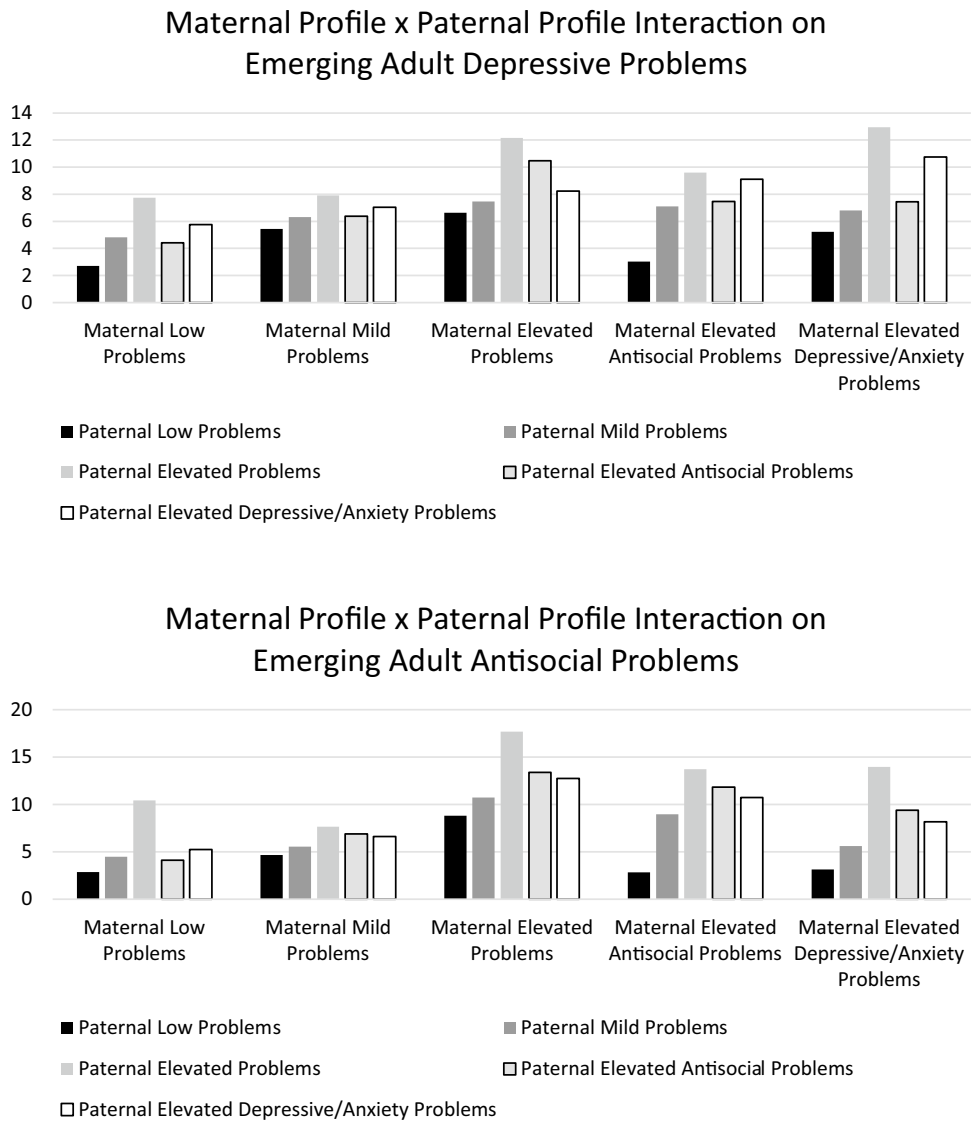

Fig. 2 Maternal profile × paternal profile interactions on emerging adult depressive and antisocial problems

and discussed next, and comparisons were made using LSD post hoc tests.

Univariate Gender Effects

Univariate effects for gender indicated small effects. Females, compared to males, scored higher in depressive and anxiety problems and lower in antisocial problems.

Univariate Maternal Profiles Effects

Univariate effects for the maternal profiles indicated small effects for emerging adult depressive and anxiety problems and a medium effect for emerging adult antisocial problems. Emerging adults in the low maternal problems profile rated themselves lower in depressive problems relative to all other maternal profiles, rated themselves lower in anxiety problems relative to all other maternal profiles except the elevated antisocial problems profile, and rated themselves lower on antisocial problems than all other maternal profiles except for the mild problems profile.

Excluding the low maternal problem profile described above, emerging adults in the mild maternal problems profile rated themselves lower on depressive problems than the elevated maternal problems and elevated maternal depressive/anxiety problems profiles but were not different from the elevated maternal antisocial problems profile. These participants also rated themselves higher in anxiety relative to the elevated maternal antisocial problems profile but were not different from the elevated maternal problems or elevated maternal depressive/anxiety problems profiles. These participants in the mild maternal problems profile also rated themselves lower in antisocial problems relative to all other groups.

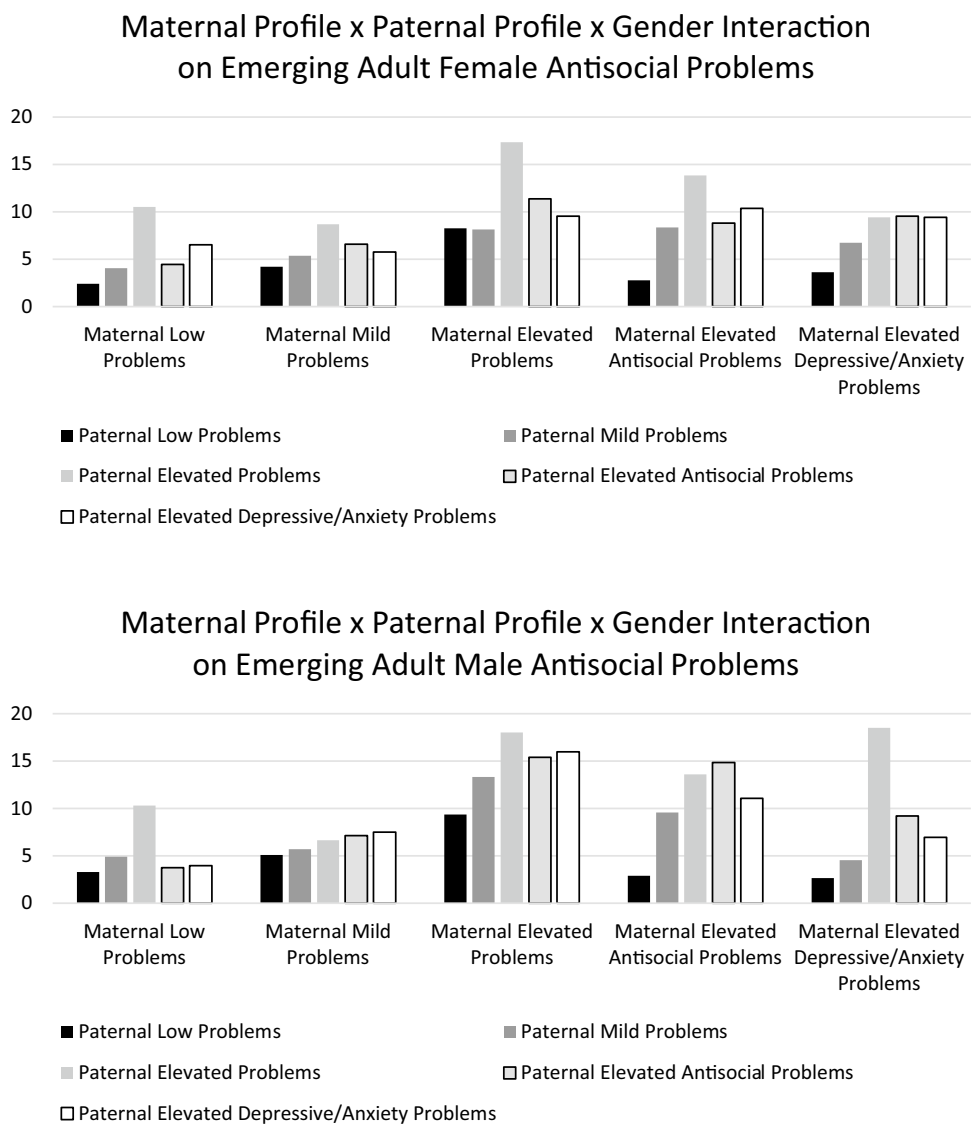

Fig. 3 Maternal profile × paternal profile × gender interaction on emerging adult female and male antisocial problems

Excluding the low and mild problem profiles, emerging adults in the elevated maternal problems profile rated themselves higher in depressive and anxiety problems than the elevated maternal antisocial problem profile but not the elevated depressive/anxiety problem profile. These participants also rated themselves higher in antisocial problems compared to elevated maternal antisocial problems and elevated depressive/anxiety problems profiles.

Excluding the low, mild, and elevated maternal problem profiles discussed above, participants in the elevated maternal antisocial problems profile rated themselves lower in depressive and anxiety problems and higher in antisocial problems than the elevated maternal depressive/anxiety problems profile.

Univariate Paternal Profiles Effects

Univariate effects for the paternal profiles indicated a small effect for emerging adult anxiety problems and medium effects for emerging adult depressive and antisocial problems. Emerging adults in the low paternal problems profile rated themselves lower in depressive, anxiety, and antisocial problems relative to all other paternal profiles (i.e., similar to the maternal effect).

Excluding the low paternal problem profile described above, emerging adults in the mild paternal problems profile rated themselves lower on depressive problems than the elevated paternal problems and elevated paternal depressive/anxiety problems profiles but were not different from the elevated paternal antisocial problems profile (i.e., same as

the maternal effect). These participants did not rate themselves differently in anxiety relative to the other profiles, in contrast to the maternal effect. These participants in the mild paternal problems profile also rated themselves lower in antisocial problems relative to all other groups, similar to the maternal effect.

Excluding the low and mild problem profiles, emerging adults in the elevated paternal problems profile rated themselves higher in depressive and antisocial problems than other profiles. These participants also did not rate themselves differently in anxiety problems compared to the other groups (i.e., elevated paternal antisocial problems and elevated paternal depressive/anxiety problems).

Excluding the low, mild, and elevated paternal problem profiles discussed above, participants in the elevated paternal antisocial problems profile did not rate themselves differently in depressive, anxiety, or antisocial problems relative to the elevated paternal depressive/anxiety problems profile. This finding is in contrast to the maternal counterpart.

Univariate Interaction Effects

The maternal profile × paternal profile interaction had small effects on emerging adult depressive and antisocial problems and no significant effect on emerging adult anxiety. As shown in Fig. 2, the effect of reporting two parents with elevated problems resulted in synergistically higher emerging adult depressive and antisocial problems than reporting only one parent with elevated problems. For the emerging adult depressive problems interaction, emerging adults reported markedly higher depressive problems when they reported the combination of elevated maternal problems alongside elevated paternal problems or elevated paternal antisocial problems (i.e., the presence of paternal antisocial problems in both cases). Similarly, emerging adults reported markedly higher depressive problems when they reported the combination of elevated paternal problems alongside elevated maternal problems or elevated maternal depressive/anxiety problems (i.e., the presence of maternal depressive/anxiety problems in both cases). Indeed, emerging adults reported the highest depressive problems when they reported elevated paternal problems alongside elevated maternal depressive/anxiety problems (i.e., the specificity of perceived maternal depressive/anxiety problems is associated with an interaction on emerging adult depressive problems).

For the antisocial problems two-way interaction, emerging adults reporting low maternal and paternal problem profiles rated themselves similarly low on antisocial problems compared to the combinations of low paternal problems profile alongside either the elevated maternal antisocial or elevated maternal depressive/anxiety problems profiles. That is, reporting a low paternal problems profile may protect against the negative associations of perceiving a mother with either antisocial or depressive/anxiety problems alone but not in combination. Conversely, the same effect was found when examining the protective effects of reporting a low maternal problems profile.

The maternal profile × paternal profile × gender interaction had a small effect on emerging adult antisocial problems and no significant effect on emerging adult depressive or anxiety problems. As shown in Fig. 3, males reported the highest antisocial problems when reporting the combination of elevated paternal problems and elevated maternal depressive/anxiety problems, whereas females did not experience such a marked elevation related to this combination (i.e., the effect occurs in males but not females, accounting for the added gender interaction). Similarly, males reported a marked elevation in antisocial problems relative to females when reporting the combination of maternal as well as paternal antisocial problem profiles. Additionally, males reporting elevated maternal problems reported higher antisocial problems than females across all paternal problem profiles.

Discussion

The current study used LPA to identify latent groups of perceived maternal and paternal psychopathology (i.e., depressive, anxiety, and antisocial problems) and associated those groups with emerging adults' psychopathology. The LPA identified various subgroups of parental psychopathology that were distinguishable based on different patterns of emerging adult psychopathology. A 5-profile solution was identified as most consistent with existing theory. A low problems profile was identified and characterized by parents with low depressive, anxiety, and antisocial problems. Secondly, a mild problems profile was identified, characterized by parents who had mild problems across the three problem types. The third profile identified included parents with clinically elevated problems across the three problem types. The fourth profile identified was comprised of parents who were clinically elevated in antisocial problems only. Lastly, the fifth group was characterized by mothers and fathers with at least borderline elevations in depressive and anxiety problems but not antisocial problems.

It is notable that the current study identified these profiles, largely as theorized. Although the mild problems group was not initially hypothesized, it is not surprising that a substantial number of parents might be perceived as having some but not clinically significant problems. As expected, the largest group included parents perceived to have low problems. In community and college samples, it would be expected that most individuals and their families would not be experiencing significantly elevated problems. Combining the low and mild problem groups (i.e., all groups without elevated problems in any domain) includes 76–77% of the

sample. Thus, a large majority of participants perceive their parents to not have significant psychological problems.

The third largest maternal and paternal groups identified included elevations across all three problem types, and smaller maternal and paternal groups identified represented those high in internalizing but not externalizing problems and vice versa. Although internalizing and externalizing problems are distinct constructs, they often but not always share significant comorbidity [46]. Thus, finding groups with both internalizing and externalizing problems as well as only one of these was expected, although it is notable that the groups with only internalizing or externalizing problems are smaller than the group with both.

Following identification of the fitted latent profiles consistent with theory, MANCOVA was used to examine how maternal and paternal profiles and participant gender were associated with emerging adult depression, anxiety, and antisocial problems. Univariate gender effects (i.e., females scored higher in depression and anxiety problems and lower in antisocial problems) were consistent with other research showing females to be higher in internalizing but lower in externalizing problems overall in comparison to men past early adolescence [12].

Main effects of the latent profiles indicated the largest effect sizes on emerging adult antisocial problems followed by depressive and then anxiety problems across both maternal and paternal profiles, and paternal profiles demonstrated larger effect sizes relative to maternal profiles across all three problem types. One possible explanation as to why parent problems generally predict emerging adult antisocial problems stronger than internalizing problems could be related to a psychological autonomy theory (Cicchetti and Rogosch 2002) as well as compromised problem-solving skills [33]. It is plausible that children of parents with psychopathology may have difficulty solving problems given that their parental models may not have exhibited effective behaviors for doing so; such children also may strive more ardently for autonomy from their problematic parents. These factors may contribute to stronger effects on antisocial problems, where emerging adults may experience higher antisocial problems related to their poor problem solving skills and desire to separate from their problematic parents.

Additionally, the sample age group and life stage may help to explain why the smallest effects were found for emerging adult anxiety problems and largest for antisocial problems. Young adults are in a stage that involves finding independence from parents (Arnett 2000). It is possible that although emerging adults' problems may be directly and indirectly related to their perceptions of their parents' problems, their newfound independence and corresponding increase in separation from parents may mean less feelings of anxiety related to parental problems; in turn, emerging adults may engage in more risky behaviors as a result of newfound autonomy and poor problem solving as described above and as discussed by McKinney and Kwan [37]. Conversely, it is plausible that in cases of children currently living with parents with psychopathology such as anxiety may be more likely to experience anxiety (e.g., unable to address their worries about their parents with problems or separate from them) and not yet have sufficient freedom to engage in antisocial behaviors related to higher parental control [3].

In all cases, when progressing from the low to mild to elevated problems groups across both mothers and fathers, emerging adults also reported higher depressive, anxiety, and antisocial problems, although these differences were sometimes not significant as described in the results section. This finding is expected given the strong link between parental and child psychopathology [28; Matsuzaka et al. 2017], although the rates of increase are sometimes notable. For example, emerging adults in the perceived maternal elevated problems profile, relative to the low problems profile, reported 1.77 times more depressive, 1.30 times more anxiety, and 2.34 times more antisocial problems; for the paternal profiles, these numbers were 2.18, 1.45, and 2.84, respectively. These findings suggest the importance of considering varying levels of parental psychopathology, as it appears that major differences may exist in child effects between a parent with low versus mild problems as well as a parent with mild versus elevated problems.

Also notable, emerging adults in the perceived parental elevated antisocial problems profiles reported higher antisocial problems than those in the perceived parental elevated depressive/anxiety problems profiles; this group reported higher depressive and anxiety problems than the elevated antisocial problems with the exception of emerging adults in these two paternal profiles reporting similar levels of anxiety problems. This finding is consistent with biological and genetic theories as well as social cognitive/modeling theory, which suggest that parents with specific types of disorders often have children with similar disorders related to biological (e.g., genetic) and environmental (e.g., modeling, harsh parenting) mechanisms [3, 16, 31].

In general, the elevated problems profiles were associated with the highest rates of emerging adult depressive and antisocial problems across domains, whereas differences in emerging adult anxiety problems were not as pronounced. In fact, emerging adults in the maternal mild problems profile actually rated their own anxiety higher than those in the maternal elevated antisocial problems profile, and this difference in the paternal profiles was not significant; moreover, emerging adult depressive problems were not statistically different between the perceived mild problems profile and perceived elevated antisocial problems profile in mothers and fathers. These findings suggest that parents with elevated antisocial behavior but not elevated internalizing problems may have a particular influence on emerging

adult antisocial problems [31], and that the specific types of paternal problems are less important than the presence of any problems when examining emerging adult anxiety.

Moreover, the lower report of emerging adult anxiety in the perceived maternal elevated antisocial problems profile (i.e., statistically similar to the low problems profile) suggests a possible endotype of psychopathy. Although this interpretation must be taken with great caution (e.g., no genetic data were gathered), high rates of antisocial behavior coupled with low anxiety have been suggestive of a controlled subtype of psychopathy referred to as primary psychopathy. Primary psychopathy is contrasted with secondary psychopathy, which demonstrates comparable antisocial behavior but greater trait anxiety and emotional lability [47], and is consistent with classic views of psychopathy that emphasize low trait anxiety as a core feature [7]. In contrast to this maternal effect, emerging adults in the perceived paternal elevated antisocial problems profile rated themselves higher in anxiety problems relative to the same maternal profile. This finding suggests that perceived paternal, but not maternal, antisocial problems, is associated with elevated anxiety problems in emerging adults.

Interaction Effects

Figure 2 depicts 2-way interactions between maternal or paternal profiles × emerging adult problems and have several noteworthy implications. Small maternal × paternal profile interaction effects on emerging adults' depressive and antisocial problems were found, whereas this interaction was not present when examining emerging adult anxiety problems. The effect of reporting two parents with elevated problems resulted in higher emerging adult depressive and antisocial problems than reporting only one parent with elevated profiles. This finding is consistent with other research suggesting that having two parents with psychopathology versus one is much more deleterious for youth outcomes; for example, children with two parents with psychopathology may be more likely to experience more severe forms of mental illness later [17, 30]. However, this effect was not found when examining emerging adult anxiety problems. Thus, the dissimilarities between the effects of parental problems on emerging adult depressive versus anxiety problems highlight the importance of teasing out internalizing problems. It also should be noted that the effect size for the maternal × paternal profile on emerging adult anxiety was at the low cutoff for a small effect (partial $\eta^2 = 0.011$), whereas the other effects for depressive and antisocial problems were larger and thus powered. That is, the current study was not powered to find this interaction in anxiety, although the practical significance of such a small effect may not be meaningful. Thus, it appears that the generally smaller main effects on anxiety problems were carried over into the interaction, relative to the larger effects found for depressive and antisocial problems.

Emerging adults reporting fathers with elevated problems or elevated antisocial problems only and reporting mothers with elevated problems appear to be most at risk for high depressive problems. Further, emerging adults with a combination of paternal elevated problems with either maternal elevated problems or maternal elevated depressive/anxiety problems were similarly most at risk for high depressive problems. Interestingly, reporting a father with low problems may be protective against the negative associations of a mother with perceived antisocial problems or a mother with depressive/anxiety problems, yet not a mother with both. This same effect was found when examining protective effects of perceiving a mother to have low problems. These findings suggest that perceiving one parent to be psychologically healthy may protect against the negative associations with the other parent's antisocial problems or depressive/anxiety problems (e.g., Finan et al. [17]) but may not be sufficient when a parent has elevated problems across both internalizing and externalizing domains. These results parallel research that suggests resilience in development is less probable when a child has experienced multiple risk factors (e.g., a parent with multiple types of problems versus a parent with anxiety or depression; Masten [32]).

Figure 3 depicts important information regarding the maternal profile × paternal profile × gender interaction on emerging adult female and male antisocial problems. Though the effects were small, males reported the highest antisocial problems when also reporting a combination of paternal elevated problems and maternal elevated depressive/anxiety problems, whereas this effect was not found for females. Further, males reported more antisocial problems relative to females when also reporting a combination of maternal and paternal antisocial problems, suggesting that males may be especially at risk of developing antisocial problems relative to females when both parents are perceived to exhibit antisocial behavior. Lastly, males who reported maternal elevated problems also reported higher antisocial problems than females across all paternal problem profiles. These findings compliment recent literature suggesting that males may be particularly impacted by their mothers' psychopathology relative to females, and relative to daughters and fathers [20]. Additionally, these findings are most consistent with general evidence suggesting males to be more likely to develop antisocial problems and females to be more likely to develop internalizing problems [15]. These gender differences in prevalence rates of the varying disorders could reflect societal norms and expectations. For example, perhaps societal norms have taught that it is more common for men to get angry, yell, and act out when they are upset, whereas for women it is more common (and thus

acceptable) to internalize emotions, and experience mood disorders as a result.

Limitations

The findings of this study should be viewed in the context of its limitations. Firstly, this sample consisted of college students from a Southern university in the United States; therefore, these results may not be generalizable to the greater population. The lack of generalizability may be due to high levels of conservatism present in the Southern United States, which influences parent–child relationships and parenting behaviors and may not be consistent with other population behaviors [35, 36, 40]. Also related to generalizability, the LPAs may have produced unique profiles specific to the current study's sample. That is, such profiles should be replicated in future studies, although the LPAs did produce the hypothesized groups based on theory and prior evidence. Additionally, the profiles produced by the current study may not have been as distinguishable as preferred. For example, those in the elevated antisocial profiles had higher anxiety/depressive problems than those in the low and mild profiles, but less than those in the elevated profiles. Moreover, a higher percentage of emerging adults reported clinically significant antisocial problems in themselves and their parents relative to depressive and anxiety problems.

These data also were gathered in a self-report format from a single informant, introducing a shared-method bias. Furthermore, mothers and fathers may have a different perception than their child, although children's perceptions of their parents are critical in regards to their current thoughts, behaviors, and emotions and are potentially just as important if not more so than actuality [37, 49]. Moreover, emerging adult children are freer to report on their parents than younger children still residing in home [18], and rating parents with whom the participant has a long-term relationship has demonstrated to provide reliable and valid ratings [1]. Nonetheless, ample research has demonstrated significant discrepancies in rating internalizing and externalizing problems based on informant. For example, research has demonstrated that parents with psychopathology consistently rated their children higher in internalizing and externalizing problems than those children rated themselves [21, 51] or as compared to parents without psychopathology [5]. Thus, it is likely that obtaining parent report would provide unique information not captured by emerging adult report, as found by Hope et al. [26] in a sample of adolescents. As reported in the results, a higher rate of antisocial problems relative to depressive and anxiety problems were identified, which is consistent with research demonstrating that internalizing problems, relative to externalizing problems, may be more difficult to detect in others and may not be viewed to be as problematic [48]. That is, internalizing problems in parents likely were underestimated by participants.

Finally, a cross-sectional design does not allow for inferences on causality or directionality of the relations demonstrated. For example, emerging adult psychopathology and associated problems may be causing strains on the parent–child relationship, which might influence the parents' own problems. Additionally, specific parenting behaviors such as warmth and autonomy granting were not assessed in the current study, which may help explain the variance between parental and emerging adult psychopathology. For example, parents perceived to have antisocial problems also may be rated as having harsher parenting practices including rejection, callousness, and punitive control, among others [11, 13]. Additionally, children who perceive their parents to have antisocial problems may experience depressive problems in response to parental callousness and limited empathy.

Summary

Overall, the current study appears to be the first to use LPA to identify highly distinct subgroups of mothers and fathers perceived to have psychopathology, finding groupings consistent with theory and evidence. The current study also examined how these subgroups differed from one another when associated with emerging adult depressive, anxiety, and antisocial problems. This identification of various patterns of parental psychopathology and problematic dyads within these patterns add to the current literature on the development of young adult psychopathology stemming from parental problems.

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