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Exploring the promise of assessing dynamic characteristics of the family for predicting adolescent risk outcomes

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Background: Family-based assessments of risk factors for adolescent emotional, behavioral, and substance use problems can be used to identify adolescents who are at risk and intervene before problems cause clinically significant impairment. Expanding traditional methods for assessing risk, this study evaluates whether *lability*, referring to the degree to which parent–adolescent relationships and parenting fluctuate from day to day, might offer additional value to assessment protocols aimed at identifying precursor risk factors. **Methods:** This study sampled 151 adolescents and caregivers, collecting data at a baseline assessment, a 21-day daily diary protocol, and a 12-month follow-up assessment. Daily diary data were used to calculate within-family lability scores in parenting practices, parent–adolescent connectedness, and parent–adolescent conflict. **Results:** Regression analyses evaluated whether lability predicted adolescent's depression, anxiety, antisocial behavior (ASB), drunkenness, and marijuana use at 12-month follow-up. Lability in parent–adolescent connectedness, accounting for baseline levels, gender, age, and initial levels of outcomes, was associated with risk for depression, anxiety, ASB, drunkenness, and marijuana use. Lability in parenting practices also was associated with risk for depression, anxiety, and drunkenness. Baseline levels moderated some of these effects. Parent–adolescent conflict lability was only associated with depression. **Conclusions:** These findings provide evidence for substantial value added when including dynamic assessments of family lability in predicting long-term adolescent risk outcomes and call for integration of dynamic methods into assessment practices. **Keywords:** Family risk assessment; adolescent psychopathology risk; adolescent substance use risk; parent–adolescent relationships; parenting practices.

Introduction

Developmentally, adolescents exhibit a notable increase in the prevalence of emotional (e.g. depression, anxiety) and behavioral (e.g. antisocial behavior) mental health problems, as well as engaging in heavy drinking or illicit drug use (Merikangas et al., 2010), underscoring adolescence as a period of vulnerability. Recent trends in rising rates of service utilization (Collishaw, 2015) indicate promising improvements in availability and perceived acceptability of mental health services; however, psychiatric problems are costly to the individual experiencing impairment, to educational and social settings, and to society at large (Greenberg & Lippold, 2013). From a public health standpoint, it is more humane, efficient, and effective to identify and intervene with at-risk adolescents early, before onset of clinically significant impairment (Catalano et al., 2012). Such risk identification calls for a shift away from symptom screening (e.g. depression screeners) to a focus on *precursor risk factors* that foreshadow clinically significant problems (Burns & Rapee, 2016). To effectively identify adolescents at risk for developing problems, it is critical to fully characterize the nature and influence of precursor risk factors.

Family functioning plays a central role in adolescent well-being, with effects that persist into adulthood (Fosco, Caruthers, & Dishion, 2012). Positive family relationships and effective parenting are well-established protective factors, while family environments characterized by poor relationships, harsh parenting, and high conflict undermine adolescent mental health and elevate risk for engaging in antisocial behavior (ASB) and substance use (Greenberg & Lippold, 2013; Repetti, Taylor, & Seeman, 2002). Perhaps equally important is the accumulating evidence that these family factors are malleable and amenable to family-centered preventive interventions (Redmond et al., 2009). Thus, accurate assessments of malleable family risk and protective factors can identify adolescents at risk and guide intervention resources to ameliorate precursor risk before problems become entrenched.

Three parent–adolescent factors have garnered considerable empirical support to have associations with mental health problems, problem behavior, and substance use in adolescence. These factors include the following: (a) effective *parenting practices*, referring to warmth, praise for good behavior, consistency, and parental monitoring; (b) *parent–*

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adolescent connectedness, referring to relationships characterized by trust, communication, and emotional closeness; and (c) *parent–adolescent conflict* referring to disagreements and/or hostility. All three factors are consistently associated with these key outcomes in cross-sectional and longitudinal studies (Ackard, Neumark-Sztainer, Story, & Perry, 2006; Duncan, Duncan, Biglan, & Ary, 1998; Laird, Pettit, Bates, & Dodge, 2003; Van Ryzin, Fosco, & Dishion, 2012; Weymouth, Buehler, Zhou, & Henson, 2016).

We argue that it is important to distinguish between traditional approaches that assess *levels* of family risk or protective factors and dynamic approaches that assess *lability* – the extent to which risk and protective factors fluctuate within families. Traditional, global assessments capturing levels of family risk or protective factors, such as single-occasion surveys or observations, represent the vast majority of extant basic research to date. These assessments offer information about overall perceptions of how close and connected an adolescent feels toward his/her parent, or the degree to which parents use effective parenting practices.

Dynamic characteristics of the family, such as lability in relationships or parenting over time, offer additional information about risk that is not captured in global assessments (Ram & Gerstorf, 2009). Lability refers to the degree to which parenting practices, parent–child connectedness, and parent–child conflict fluctuate around their average levels over time (Lippold, Fosco, Ram, & Feinberg, 2016). As an illustration, two families may report identical levels of overall relationship quality in a global assessment, but one family may have the similar scores each day (low lability), while the other fluctuates from extreme high to extreme low scores across days (high lability). Although indistinguishable in terms of their levels of relationship quality, adolescents in these two families have fundamentally different relationship dynamics at home. An assessment of lability would be necessary to differentiate risk in these families that would otherwise go undetected in traditional assessments.

High lability may be an additional risk factor for maladjustment. From a deviance perspective, lability in parenting practices or connectedness would reflect day-to-day 'gaps' in parental involvement that provide unsupervised opportunities for adolescents to engage in problem behavior or substance use (Ary et al., 1999). From a bonding perspective, lability in parent–adolescent relationships may undermine adolescents' sense of security and stability in their relationships with their parents, which is a foundational context for identity, social, and behavioral development (Ackard et al., 2006; Rohner, 2004). Lability in connectedness may erode adolescents' confidence that they can rely on parental support when they experience difficulties, and they may even experience periods of disconnect as rejection. Additionally, lability in parenting, connectedness, and conflict would reflect intermittent periods of hostility or deficient nurturance that are stressful for youth; over time, this stress accumulates to undermine physical and mental health (Repetti et al., 2002). These three perspectives converge around the common theme that lability in parenting and parent–adolescent relationships should signal risk for poorer long-term adolescent outcomes.

Emerging evidence highlights lability as a unique and robust predictor of adolescent mental health and substance use outcomes, even when accounting for levels of those family factors. High lability in parenting from year to year is a risk factor for substance use, delinquency, and depression, even when accounting for average levels of parenting during that time (Lippold, Fosco, et al., 2016; Lippold, Hussong, Fosco, & Ram, 2018). At a daily timescale, high lability in parental warmth was associated with diminished youth well-being, accounting for average levels across days (Lippold, Davis, Lawson, & McHale, 2016). The current study evaluates whether assessments of day-to-day lability in parenting practices, parent–adolescent connectedness, and parent–adolescent conflict provide additional predictive value – uniquely or in combination with traditional global assessments of these constructs – in predicting adolescent risk for depression, anxiety, ASB, and substance misuse. Such information could guide improvements to standard practices in risk screening.

The current study

Intensive longitudinal methods, such as daily diary methods, have unique strengths in capturing aspects of family life that may get lost in broad-stroke, single-occasion assessments (Bolger & Laurenceau, 2013). Daily diary designs offer several advantages over traditional assessments because they minimize recall bias by shortening the reporting timeframe, are more sensitive to capturing low-intensity experiences, and offer ecological validity by assessing family members in their natural environment (Shiffman, Stone, & Hufford, 2008). We leveraged a 21-day daily diary design to assess lability in parenting practices, parent–adolescent connectedness, and parent–adolescent conflict. These lability indicators were then evaluated as predictors of adolescent well-being alongside baseline global assessments of these constructs (akin to a traditional screening tool). Our guiding research questions were as follows: (a) does lability contribute unique predictive value for adolescent depressive symptoms, anxiety symptoms, ASB, and substance use one year later? and (b) is lability associated with these outcomes at all levels of baseline family functioning (i.e. baseline level as a moderator of lability and outcomes)? It is possible that lability is only a risk in certain families (e.g. in the context of moderate to low relationship quality).

Methods

Sample

Participants were 151 families of 9th and 10th grade adolescents who participated in part of the larger Penn State Family Life Optimizing Well-being (FLOW) study, which was approved by the University Institutional Review Board. Families were recruited through high schools and family referrals to take part in a longitudinal study that included a daily diary assessment. Families were eligible for the study if they met the following criteria: adolescents lived in one, two-caregiver household continuously, Internet access and means to complete the daily surveys at home, English fluency, the participating adolescent was in 9th or 10th grade, and both parent and adolescent agreed to participate (via consent and assent). The adolescents (61.5% female) were between the ages of 13 and 16 years old (M = 14.60, SD = 0.83) and majority Caucasian (83.4%). Caregivers (95.6% female) were on average 43.4 years of age (Range 30–61), majority Caucasian (90.1%), with the majority of parents being married (88.7%), having a median income of $70,000–$79,999, and at least a high school degree (96.6%). In this specific study, families who participated completed baseline assessments and then were assigned to complete daily assessments across 21 days and a follow-up at 12 months. Daily questionnaires took approximately 5 min to complete and were sent out nightly at 7 p.m., and access to links was available until 9 a.m. the following morning.

Attrition

Of the 151 families, 10 youth did not complete the 12-month assessment. Comparisons of demographic (e.g. sex, age, family income), baseline family factors (e.g. parent–child relationship), and baseline adolescent factors (e.g. anxiety, ASB) revealed only two predictors of attrition: Younger parents (t (141) = −1.98, p = .05) and low child anxiety (t (32.40) = −7.16, p < .001) were slightly more likely to drop out of the study. The final analytic sample for this study was 141 adolescents and their parents.

Measures

Baseline Risk Assessment. Parents reported on their *parenting practices* at baseline using the General Child Management scale (Spoth, Redmond, & Shin, 1998). The 13 items were rated from 1 (*Never*) to 5 (*Always*), capturing parental monitoring, positive discipline, consistency, and harsh parenting (reverse-coded) and had good reliability (α = .72). *Parent–adolescent connectedness* was reported by parents and adolescents. Parents completed the 10-item closeness subscale of the Parent Child Relationship Scale (Hetherington & Clingempeel, 1992). Items were rated from 1 (*Not at all*) to 5 (*Extremely*) and had high reliability (α = .90). Adolescents rated 10 items from the communication and trust subscales of the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987). Items were rated from 1 (*Completely Untrue*) to 5 (*Completely True*) and had high reliability (α = .91). *Parent–adolescent conflict* was reported by parents and adolescents. Parents completed the 3-item recurring conflict scale and the 2-item negative affective quality scale. These five items were rated from 1 (*Never*) to 5 (*Always*) and had good reliability (α = .76). Adolescents completed five items from the Behavioral Affective Rating Scale (Conger, 1989), rated from 1 (*Almost Never*) to 5 (*Almost Always*) scale with good reliability (α = .85). See Appendix S1 for a list of items in these scales.

Daily measures for lability. The baseline risk measures were mirrored in daily assessments, adapted as needed to fit a daily timescale. All items were rated on a 10-point sliding scale (with 0.1 increments). Parents reported on daily *parenting practices*, including five items that tap into warmth, praise, consistency, and effective limit setting. This scale exhibited good between-person reliability across diary days (R_{1F} = .83). Parents and adolescents rated four items assessing *parent–adolescent connectedness* on a daily basis. A sample item included 'I felt close and connected to my [parent/child] today'. Reliability was good for parent (R_{1F} = .90) and adolescent reports (R_{1F} = .95). Finally, parents and adolescents rated two items assessing *parent–adolescent conflict* (e.g. 'How much tension was there between you and your child?'). Reliability was good for parents (R_{1F} = .57) and adolescents (R_{1F} = .77). After missing data were removed, lability scores were computed using mean squared successive differences (MSSD), which captures the extent of individuals' change from one day to the next across all days (temporal instability) and is less vulnerable to trends in the data (Jahng, Wood, & Trull, 2008). This resulted in three variables: parenting lability, connectedness lability, and conflict lability.

Adolescent outcomes. All outcomes measures were assessed by adolescent report at baseline and 12-month follow-up. *Depressive symptoms* were assessed using the 10-item depression subscale of the Revised Child Anxiety and Depression Scale (RCADS; Ebesutani et al., 2012). Adolescents reported how often things happened to them by indicating *Never* (1), *Sometimes* (2), *Often* (3), and *Always* (4) to items such as 'I feel sad or empty.' Reliability was good at baseline and follow-up (α = .91, .92). *Anxiety symptoms* were assessed using the 7-item Generalized Anxiety Disorder – 7 scale (GAD-7; Spitzer, Kroenke, Williams, & Lowe, 2006). Adolescents rated how often in the last 2 weeks they experienced symptoms (e.g. 'feeling nervous, anxious, or on edge'), from *Not at All* (1), *Several Days* (2), *More Than Half the Days* (3), and *Nearly Everyday* (4). Reliability was good at baseline and follow-up (α = .90, .94). ASB was assessed using the 10-item Antisocial Behavior Scale (Dishion & Cavanaugh, 2003). Adolescents rated past-month frequency of behaviors such as 'intentionally hit or threatened to hit someone' from *Never* (1), *Once or Twice* (2), *3–5 Times* (3), *6–10 Times* (4), *11–20 Times* (5), and *More Than 20 Times* (6). This scale had good reliability at baseline and follow-up (α = .87 and .95). Substance use was assessed as past-month frequency of being drunk and smoking marijuana, using a single item for each: 'How many times did you [get drunk/smoke marijuana] in the past month?'

Results

Descriptive statistics and bivariate correlations among study variables are presented in Table 1. Correlations indicated that baseline levels of parenting and connectedness were only modestly correlated with lability scores (r's = −.18 to −.27). However, baseline levels of conflict and conflict lability were more highly correlated (r's = .42 to .47), yet still distinct constructs.

Table 2 presents three sets of hierarchical regression analyses in which 12-month outcomes were regressed on baseline levels of family variables and lability scores. Baseline scores of outcomes, age, and gender were added as covariates. In a second step, an interaction term for baseline levels and lability was entered in the equation. Before analysis, all predictors and outcomes were standardized. In order to minimize risk of false discovery rate due to multiple statistical tests, p-value calculations were adjusted using the Benjamini-Hochberg (1995) approach.

Table 1 Means, standard deviation, and bivariate correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Depressive symptoms	–																
2. Anxiety symptoms	.69*	–															
3. ASB	.20*	.31*	–														
4. Drunkenness	.03	.15	.30*	–													
5. Marijuana use	−.04	.08	.30*	.63*	–												
6. Baseline Parenting (P)	−.27*	−.20*	−.15	−.10	−.02	–											
7. Baseline Connect (A)	−.23*	−.10	−.10	−.04	.05	.16	–										
8. Baseline Connect (P)	−.25*	−.14	−.15	−.08	−.03	.53*	.39*	–									
9. Baseline Conflict (A)	.34*	.28*	.12	.04	.00	−.14	−.34*	−.15	–								
10. Baseline Conflict (P)	.29*	.20*	.06	.10	.06	−.49*	−.26*	−.41*	.44*	–							
11. Parenting Lability (P)	.33*	.21*	.27*	.34*	.13	−.19*	−.07	−.23*	.16	.21*	–						
12. Connect Lability (A)	.38*	.25*	.26*	.30*	.32*	−.12	−.18*	−.21*	.34*	.24*	.43*	–					
13. Connect Lability (P)	.30*	.17*	.40*	.29*	.18*	−.21*	−.06	−.27*	.23*	.20*	.72*	.51*	–				
14. Conflict Lability (A)	.28*	.10	.17*	.03	.06	−.14	−.10	−.05	.42*	.24*	.31*	.58*	.41*	–			
15. Conflict Lability (P)	.35*	.19*	.18*	.15	−.04	−.28*	−.22*	−.22*	.32*	.47*	.52*	.26*	.44*	.39*	–		
16. Age	.03	−.07	.01	.01	−.01	−.07	.10	−.09	−.12	−.04	.04	.07	−.04	.05	.02	–	
17. Male gender	−.14	−.17*	.28*	.16	.01	−.11	−.02	−.20*	−.03	.17*	.27*	.05	.20*	.06	.17*	.11	–
M	1.54	1.58	1.18	0.12	0.17	4.11	4.22	4.16	1.69	2.09	1.90	2.64	2.41	4.60	4.76	14.74	0.38
SD	0.63	0.77	0.55	0.61	0.92	0.42	0.68	0.60	0.70	0.57	1.82	4.40	2.62	6.67	5.48	0.72	0.49

A, adolescent report of family variable; Conflict, Parent–Adolescent Conflict; Connect, Parent–Adolescent Connectedness; P, parent report of family variable; Parenting, Parenting practices.
*$p < .05$.

Table 2 Hierarchical regressions of family variables predicting adolescent adjustment outcomes

		Depressive symptoms	Anxiety symptoms	Antisocial behaviors	Drunkenness	Marijuana use
Parenting practices		β	β	β	β	β
Step 1 (R^2)		(.37**)	(.23**)	(.15**)	(.19**)	(.02^{ns})
Baseline Parenting Practices	P	−.16	−.15	−.08	−.02	–
Parenting Lability	P	.29**	.18*	.17	.29**	–
Outcome at Baseline	P	.40**	.32**	.15	.24**	–
Age		.00	−.10	−.04	−.04	–
Gender		−.39*	−.31	.40	.16	–
Step 2 (R^2)		(.39**)	(.23**)	(.16**)	(.20**)	(.03^{ns})
Baseline*Lability	P	−.16	−.05	−.11	−.12	–
Connectedness						
Step 1 (R^2)		(.33**/.33**)	(.20**/.21**)	(.16**/.22**)	(.20**/.17**)	(.11*/.04^{ns})
Baseline Connectedness	A/P	−.06/−.09	−.02/−.12	−.03/−.02	.01/−.01	.12/–
Connectedness Lability	A/P	.27**/.24**	.17*/.12	.21*/.33**	.31**/.25**	.33**/–
Outcome at Baseline	A/P	.40**/.42**	.33**/.35**	.13/.11	.28**/.25**	.03/–
Age		.00/.02	−.10/−.09	−.05/−.01	−.06/−.02	−.06/–
Gender		−.22/−.33	−.19/−.26	.50*/.39	.30/.21	.02/–
Step 2 (R^2)		(.35**/.36**)	(.20**/.23**)	(.21**/.22**)	(.24**/.18**)	(.20**/.04^{ns})
Baseline*Lability	A/P	.14/−.21	.04/−.20	.24**/−.06	.20*/−.13	.32**/–
Conflict						
Step 1 (R^2)		(.31**/.38**)	(.19**/.20**)	(.13**/.13**)	(.11*/.12**)	(.01^{ns}/.01^{ns})
Baseline Conflict	A/P	.12/.03	.15/.05	.05/−.07	.03/.02	–/–
Conflict Lability	A/P	.16/.34**	−.03/.14	.10/.15	.00/.10	–/–
Outcome at baseline	A/P	.42**/.46**	.33**/.34**	.15/.16	.27**/.27**	–/–
Age		.02/.01	−.07/−.09	−.03/−.04	−.04/−.04	–/–
Gender		−.21/−.31	−.16/−.23	.51*/.48*	.32/.28	–/–
Step 2 (R^2)		(.32**/.38**)	(.20**/.20**)	(.14**/.14**)	(.11*/.16**)	(.01^{ns}/.02^{ns})
Baseline*Lability	A/P	−.10/−.01	−.09/−.03	−.08/−.15	.03/.22	–/–

β = Standardized Coefficients (unstandardized regression coefficients were used for the categorical variable Gender). Baseline*Lability reflects the interaction term between baseline family variable and the lability score. A, adolescent report of family variable; P, parent report of family variable.
*p < .05, **p < .01.

The first set of analyses focused on parenting practices. All models, except that predicting marijuana use, accounted for statistically significant variance in the outcomes. Baseline parenting practices were not associated with any of the outcomes. Higher parenting lability was associated with increases in adolescents' depressive symptoms (β = .29), anxiety symptoms (β = .18), and drunkenness (β = .29) at 12-month follow-up. Neither baseline parenting nor parenting lability were associated with ASB. None of the interaction terms for baseline parenting*lability were statistically significant.

The second set of analyses focused on parent–adolescent connectedness, computed separately using adolescent and parent reports of connectedness. Baseline levels of connectedness were not associated with any of the five outcomes. However, connectedness lability was associated with increases in depressive symptoms (β = .27/.24), ASB (β = .21/.33), and increases in the frequency of drunkenness (β = .31/.25) in models in which both adolescent and parent reported connectedness, respectively. Connectedness lability was associated with increases in anxiety symptoms (β = .17) and marijuana use (β = .33) in models using adolescent, but not parent, report of connectedness. In the second step, three baseline*lability interactions (via adolescent report) emerged as significant for connectedness, when predicting ASB, drunkenness and marijuana use. These interactions were probed in two ways (see Figure 1 for an example). We examined simple slopes for lability at high (+1 *SD*) and low (−1 *SD*) values of baseline connectedness. Connectedness lability was associated with increases in ASB (β = .47), drunkenness (β = .52), and marijuana use (β = .65) at relatively high (but not low) levels of baseline connectedness. Specificity is offered in calculations of the region of significance, such that connectedness lability was associated with increases in ASB when baseline connectedness was −0.27 *SD* or higher (values were standardized), with drunkenness when baseline connectedness was −0.70 *SD* or higher, and with marijuana use when baseline connectedness was greater than −0.49 *SD*. These findings suggested minimum levels of connectedness needed for lability to serve as a risk factor for these three outcomes were below the sample average. However, at *extremely* low levels of baseline connectedness, lability was negatively associated with marijuana use (−2.33 *SD*; 1.4% of the sample).

The third set of analyses focused on parent–adolescent conflict using adolescent and parent report of conflict. Of the 10 models run, only one finding emerged as statistically significant. Parent

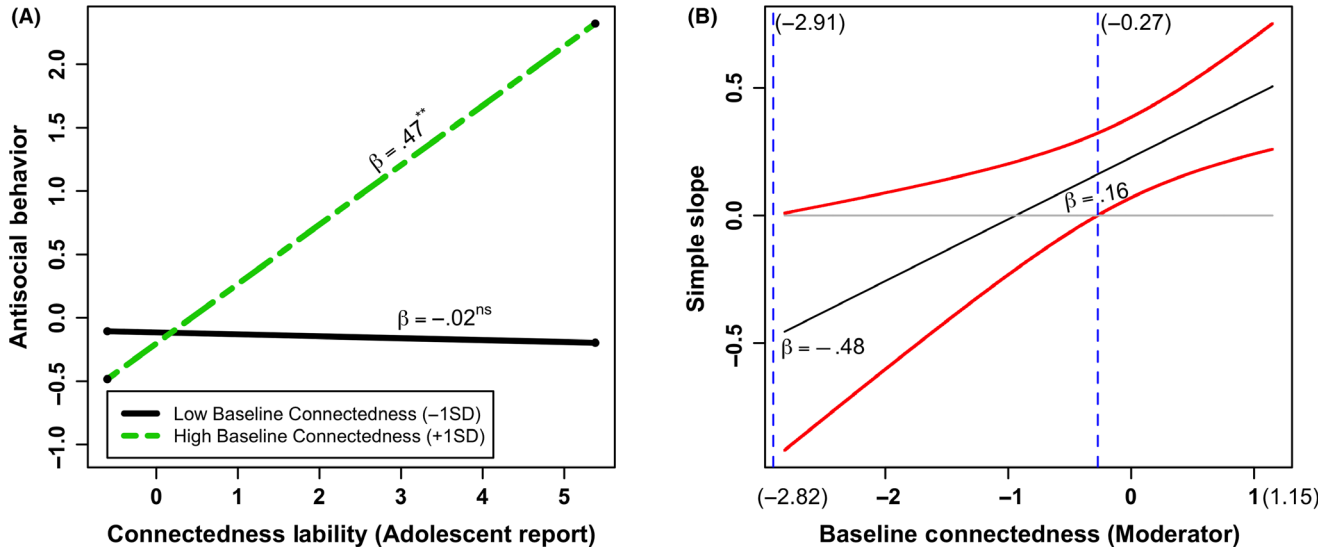

Figure 1 Example plot of baseline connectedness*connectedness lability in relation to adolescent antisocial behavior. (A) Plotted simple slopes for connectedness lability and ASB at 1 *SD* above and below the mean level of baseline connectedness. (B) The region of significance for connectedness lability at different levels of baseline connectedness in relation to ASB. Simple slopes are significant outside the lower and upper bounds (dotted vertical lines) [Colour figure can be viewed at wileyonlinelibrary.com]

report of conflict lability was associated with increases in adolescent depressive symptoms (β = .34).

As a robustness test of lability as a predictor of risk outcomes, regressions were recomputed by adding individual mean scores (iMean) of family variables across the 21 days of the study to the models. When including both baseline and iMean scores, only two findings for lability changed: Parenting lability and connectedness lability became statistically non-significant predictors of anxiety. Ten of the 12 coefficients remained statistically significant, suggesting that the pattern of results was robust, relative to the baseline ratings and relative to the average ratings (across days) of family functioning.

Discussion

This study evaluated whether there is added predictive value gained by incorporating assessments of family lability to traditional (single-assessment) screening approaches when predicting adolescent depression, anxiety, ASB, and substance use. Lability in parenting practices and parent–adolescent connectedness exhibited robust predictive value for most of these outcomes. However, parent–adolescent conflict and conflict lability were not significant predictors in this sample. Overall, this study underscores the promise of integrating dynamic assessments of family lability into traditional screening approaches as a means of strengthening precursor risk screening in adolescents.

Parenting lability was a risk factor for adolescent depression, anxiety, and drunkenness, regardless of baseline levels of parenting. Vacillations in the quality of parenting from day to day reflect a family context in which there are days when family rules are upheld and good behavior is praised and other days when limits are not enforced and good behavior may go unacknowledged. From this view, adolescents may experience parenting lability as intermittently rejecting, unpredictable, and stressful. Over time, these experiences may undermine adolescents' sense of security in the family and/or may accumulate to overwhelm their coping resources, undermining their mental health, as indicated by increases in depression and anxiety (Repetti et al., 2002; Rohner, 2004). In addition, the link between parenting lability and increases in drunkenness is consistent with a deviance model of risk in which intermittent periods of diminished parenting may also create opportunities for adolescents to engage in deviant behavior (Ary et al., 1999).

High levels of lability in parent–adolescent connectedness were a consistent predictor of most outcomes in this study. However, nuance in these findings emerged when considering baseline levels of connectedness as a moderator of lability. Baseline connectedness moderated connectedness lability when predicting ASB, drunkenness, and marijuana use, but not when predicting depression or anxiety outcomes. These findings may indicate that there are different underlying risk processes at work for these outcomes.

From a deviance perspective, our results indicate that 'gaps' from day to day in connectedness are a risk factor for ASB and substance use, in the context of a close overall relationship. During periods of disconnect, adolescents may not seek parental guidance or advice when navigating developmental challenges (e.g. peer substance use), or may even seek connection with a deviant peer group that amplifies their risk for ASB and substance use outcomes (Ackard et al., 2006; Dishion, Nelson, & Bullock,

2004). However, in families with low general connectedness, lability would not create 'gaps' in supervision or guidance, thereby not conferring risk for deviant behaviors.

However, connectedness lability is a risk factor for depression and anxiety, regardless of baseline relationship levels. These relationships characterized by days of feeling close and connected and days of feeling disconnected may reflect a context of intermittent and unpredictable nurturance, leading to accumulating stress that erodes adolescents' mental health over time (Repetti et al., 2002). Another interpretation may be that disrupted security in the parent–adolescent relationship may elicit emotional distress over time (Rohner, 2004).

Findings for parent–adolescent conflict were surprising: neither level nor lability were associated with adolescent outcomes (except depression), which is inconsistent with past work. This raises questions about whether these measures were not capturing risk processes sufficiently, or if this sample had unusually low levels of conflict. Regardless, we advise caution when interpreting these null results until systematic replication is conducted. However, the pattern of correlations among baseline and lability scores for conflict, compared to parenting and connectedness, was noteworthy. Specifically, conflict lability was considerably more highly correlated with the baseline level than the others, perhaps shedding light onto conflict as a process. Distinguishing between level and lability in conflict may be less appropriate. By definition, conflict may be an episodic process, such that families with higher conflict may experience more conflict events (e.g. a 'spiky' line), whereas parenting and connectedness may reflect a continuous (rather than episodic) process, characterized by smooth lines across days. Research characterizing couple conflicts underscores the importance of capturing frequency and intensity of conflict in the home (Fosco, DeBoard, & Grych, 2007). Alternatively, the high correlation between lability and level of conflict may also indicate a 'floor effect' limiting the measurement of lability. Future work using higher-risk samples should explore these issues.

This study has implications for family risk assessment and/or screening, family-based interventions, and basic family science. First and foremost, the current findings call for more work incorporating dynamic characteristics of the family – such as lability – into developmental models of risk and protective processes. Our findings underscore the importance of assessing lability in parenting and parent–adolescent connectedness when predicting adolescent depression, anxiety, ASB, and substance use. Traditional family risk assessments may benefit from integrating dynamic assessments of lability to capture a more comprehensive picture of adolescent risk for long-term problems. With the ever-increasing ubiquity of mobile technology, there is an opportunity for brief and efficient daily surveys to be integrated into family risk assessments. This calls for the development of accessible and engaging assessments with added potential for real-time feedback delivery to families.

This study also holds implications for family-based interventions. Intervention evaluations should incorporate dynamic assessments of family functioning to better understand the change processes underlying their effects. Currently, little is known about whether interventions can reduce lability in these processes. Systematic work is needed to (a) evaluate whether existing interventions effectively reduce lability in these relationships and (b) develop new intervention content or components that can bolster intervention effects regarding lability. An important first step is to incorporate daily diary designs in pre–post assessments of family-based interventions.

Finally, the current study points to new gaps in family theory that await explicit evaluation. We identified several perspectives – deviance models, parent–adolescent bonding, and stressor accumulation – that may explain associations between family lability and adolescent outcomes. However, the next step for this basic family research is to better explicate which of these processes explain the effects presented in this study, or refine theories to better explicate the underlying processes.

There were several limitations to this study. First, this sample was relatively low risk. Future work should replicate these findings in a sample of families with a greater range of risk across family conflict, relationship quality, and adolescent risk. Moreover, greater racial, socioeconomic, and family structure diversity would provide a more generalizable test of lability in family functioning as a precursor risk factor for adolescent mental health problems and substance misuse. Future work should also include other domains of family functioning that may inform family risk assessments, such as family-level cohesion and sibling relationship quality. Finally, other dynamic characteristics, such as rigidity or reactivity in family functioning, may also offer promise as precursor risk factors for adolescent problem outcomes (Ram & Gerstorf, 2009).

In conclusion, this study provides compelling preliminary evidence for the importance of incorporating dynamic characteristics of the family – in this case, lability in parenting and parent–adolescent connectedness – into family risk assessments for adolescent depression, anxiety, antisocial behavior, and substance misuse. Beyond traditional approaches to family screening that focus on the presence or absence of risk and protective factors (i.e. levels of family functioning), understanding the degree to which families exhibit lability in functioning can provide unique insight into adolescent risk. These findings call for expanded assessments of

family functioning and enhanced evaluation of family-based interventions.

Supporting information

Additional supporting information may be found online in the Supporting Information section at the end of the article:

Appendix S1. Items included in baseline risk assessment.

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Key points

- Identifying precursor family risk factors is critical for preventing serious mental health and substance use problems in adolescents.
- The current state of the field relies on single-assessment risk assessments, which may offer incomplete predictive information.
- Our findings, using daily diary methods, reveal that lability (day-to-day variability) in parenting practices and parent–adolescent connectedness were robust predictors (accounting for traditional screening measures) of adolescent mental health problems, antisocial behavior, and substance use.
- Future work should integrate dynamic methods into family risk assessments.

References

Ackard, D.M., Neumark-Sztainer, D., Story, M., & Perry, C. (2006). Parent-child connectedness and behavioral and emotional health among adolescents. *American Journal of Preventive Medicine*, *30*, 59–66.

Armsden, G.C., & Greenberg, M.T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth & Adolescence*, *16*, 427–454.

Ary, D.V., Duncan, T.E., Biglan, A., Metzler, C.W., Noell, J.W., & Smolkowski, K. (1999). Development of adolescent problem behavior. *Journal of Abnormal Child Psychology*, *27*, 141–150.

Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society*, *57*, 289–300.

Bolger, N., & Laurenceau, J.-P. (2013). *Intensive longitudinal methods: An introduction to diary and experience sampling research*. New York: Guilford Press.

Burns, J.R., & Rapee, R.M. (2016). Psychological assessment screening for mental health risk in high schools: The development of the youth RADAR screening for mental health risk in high schools: The development of the youth RADAR. *Psychological Assessment*, *28*, 1220–1231.

Catalano, R.F., Fagan, A.A., Gavin, L.E., Greenberg, M.T., Irwin, C.E., Ross, D.A., & Shek, D.T.L. (2012). Worldwide application of prevention science in adolescent health. *The Lancet*, *379*, 1653–1664.

Collishaw, S. (2015). Annual research review: Secular trends in child and adolescent mental health. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *56*, 370–393.

Conger, R. D. (1989). Iowa youth and families project, wave A. In *Report prepared for Iowa State University*. Ames, IA: Institute for Social and Behavioral Research.

Dishion, T.J., & Kavanagh, K. (2003). *Intervening in adolescent problem behavior: A family-centered approach*. New York, NY: Guilford.

Dishion, T.J., Nelson, S.E., & Bullock, B.M. (2004). Premature adolescent autonomy: Parent disengagement and deviant peer process in the amplification of problem behavior. *Journal of Adolescence*, *27*, 515–530.

Duncan, S.C., Duncan, T.E., Biglan, A., & Ary, D. (1998). Contributions of the social context to the development of adolescent substance use: A multivariate latent growth modeling approach. *Drug and Alcohol Dependence*, *50*, 57–71.

Ebesutani, C., Reise, S.P., Chorpita, B.F., Ale, C., Regan, J., Young, J., ... & Weisz, J.R. (2012). The revised child anxiety and depression scale-short version: Scale reduction via exploratory bifactor modeling of the broad anxiety factor. *Psychological Assessment*, *24*, 833–845.

Fosco, G.M., Caruthers, A.S., & Dishion, T.J. (2012). A six-year predictive test of adolescent family relationship quality and effortful control pathways to emerging adult social and emotional health. *Journal of Family Psychology*, *26*, 565–575.

Fosco, G.M., DeBoard, R.L., & Grych, J.H. (2007). Making sense of family violence: Implications of children's appraisals of interparental aggression for their short- and long-term functioning. *European Psychologist*, *12*, 6–16.

Greenberg, M.T., & Lippold, M.A. (2013). Promoting healthy outcomes among youth with multiple risks: Innovative approaches. *Annual Review of Public Health*, *34*, 253–270.

Hetherington, E.M., & Clingempeel, W.G. (1992). Coping with marital transitions: A family systems perspective. *Monographs of the Society for Research in Child Development*, *57*, 1–242.

Jahng, S., Wood, P.K., & Trull, T.J. (2008). Analysis of affective instability in ecological momentary assessment: Indices

using successive difference and group comparison via multilevel modeling. *Psychological Methods*, *13*, 354–375. https://doi.org/10.1037/a0014173.

Laird, R.D., Pettit, G.S., Bates, J.E., & Dodge, K.A. (2003). Parents' monitoring-relevant knowledge and adolescents' delinquent behavior: Evidence of correlated developmental changes and reciprocal influences. *Child Development*, *74*, 752–768.

Lippold, M.A., Davis, K.D., Lawson, K.M., & McHale, S.M. (2016). Day-to-day consistency in positive parent-child interactions and youth well-being. *Journal of Child and Family Studies*, *25*, 3584–3592.

Lippold, M.A., Fosco, G.M., Ram, N., & Feinberg, M.E. (2016). Knowledge lability: Within-person changes in parental knowledge and their associations with adolescent problem behavior. *Prevention Science*, *17*, 274–283.

Lippold, M.A., Hussong, A., Fosco, G.M., & Ram, N. (2018). Lability in the parent's hostility and warmth toward their adolescent: Linkages to youth delinquency and substance use. *Developmental Psychology*, *54*, 348–361.

Merikangas, K.R., He, J.P., Burstein, M., Swanson, S.A., Avenevoli, S., Cui, L., ... & Swendsen, J. (2010). Lifetime prevalence of mental disorders in U.S. adolescents: Results from the national comorbidity survey replication-adolescent supplement (NCS-A). *Journal of the American Academy of Child and Adolescent Psychiatry*, *49*, 980–989.

Ram, N., & Gerstorf, D. (2009). Time-structured and net intraindividual variability: Tools for examining the development of dynamic characteristics and processes. *Psychology and Aging*, *24*, 778–791.

Redmond, C., Spoth, R.L., Shin, C., Schainker, L.M., Greenberg, M.T., & Feinberg, M. (2009). Long-term protective factor outcomes of evidence-based interventions implemented by community teams through a community-university partnership. *Journal of Primary Prevention*, *30*, 513–530.

Repetti, R.L., Taylor, S.E., & Seeman, T.E. (2002). Risky families: Family social environments and the mental and physical health of offspring. *Psychological Bulletin*, *128*, 330–366.

Rohner, R.P. (2004). The parental "acceptance-rejection syndrome": Universal correlates of perceived rejection. *American Psychologist*, *59*, 830–840.

Shiffman, S., Stone, A.A., & Hufford, M.R. (2008). Ecological momentary assessment. *Annual Review of Clinical Psychology*, *4*, 1–32.

Spitzer, R., Kroenke, K., Williams, J., & Lowe, B. (2006). A brief measure for assessing generalized anxiety disorder. *Archives of Internal Medicine*, *166*, 1092–1097.

Spoth, R., Redmond, C., & Shin, C. (1998). Direct and indirect latent-variable parenting outcomes of two universal family-focused preventive interventions: Extending a public health-oriented research base. *Journal of Consulting and Clinical Psychology*, *66*, 385–399.

Van Ryzin, M.J., Fosco, G.M., & Dishion, T.J. (2012). Family and peer predictors of substance use from early adolescence to early adulthood: An 11-year prospective analysis. *Addictive Behaviors*, *37*, 1314–1324.

Weymouth, B.B., Buehler, C., Zhou, N., & Henson, R.A. (2016). A meta-analysis of parent-adolescent conflict: Disagreement, hostility, and youth maladjustment. *Journal of Family Theory and Review*, *8*, 95–112.

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