

## Differences in affect integration in children with and without internalizing difficulties

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### Abstract

#### Background:

Affect represents an important source of information about our internal state and the external world that can motivate and vitalize us. When affect is poorly integrated, this can lead to problems with self-regulation and psychopathology. Few studies have investigated affect integration in children.

**Objective:** This study investigates differences in affect integration in children with and without internalizing difficulties.

**Method:** Thirty-three Norwegian children (aged 9–13) with and 24 children without internalizing difficulties were interviewed with the Affect Consciousness Interview (ACI), a measure of affect integration. Data from the ACI was analyzed across nine affective categories (Interest/Excitement, Enjoyment/Joy, Fear/Panic, Anger/Rage, Shame/Humiliation, Sadness/Despair, Envy/Jealousy, Guilt/Remorse, and Tenderness/Care), and four dimensions (Awareness, Tolerance, Emotional, and Conceptual expressivity).

**Results:** The children differed significantly in affect integration across all dimensions and all assessed affects, both positive and negative. Emotional Expressivity, Anger/Rage, and Sadness/Despair were particularly less integrated in the children with internalizing problems.

**Conclusions:** Assessment of affect integration can provide useful information on possible underlying factors in internalizing problems in children and may help guide and personalize therapeutic interventions. Based on knowledge from empirical infant psychology interventions mimicking rich, early intersubjective experiences are recommended to increase affect integration.

**Keywords:** Affect consciousness; emotional complexity; regulation; depression, anxiety

### Introduction

Although internalizing disorders like anxiety and depression are among the highest contributors to disability and disease globally, there is a lack of progress in treatment options compared to somatic disorders (1). By identifying and understanding underlying dysfunctional processes, we can target interventions in a more focused and personalized way. Studies suggest that affect integration is implicated in psychopathology. As the development of affect integration starts in childhood, this perspective may be particularly important when working with children, but so far, most research has been done on adults. Therefore, this article presents data on affect integration in children related to internalizing difficulties.

### Affect integration

Affect integration can be defined as the “functional integration of affect, cognition, and behavior” in the affect consciousness model (2, 3). The affect consciousness model is based on an evolutionary and motivational understanding of emotion and affect within a self-psychological framework (4). In the model emotional states evolved to motivate, guide, clarify and appropriately vitalize the person/self in a complex and shifting environment, and increase the chances of goal-fulfillment and survival. The model sees affect as the main and primary motivational force in all human affairs, amplifying and focusing events as they occur (5). Furthermore, affect integration pertains to processes where emotions or affects serve as important regulators of cognitive, physiological, or behavioral states, as well as the

awareness and regulation of affective states through other domains of function (2). The great emphasis on affect as the primary motivational force and a vital source of regulation can be contrasted with cognitive behavioral approaches, where, traditionally, a greater emphasis has been placed on the regulation of affect through cognitive and behavioral processes, rather than on the importance of integration of affective experience for cognition, behavior and mental health.

When well integrated, affect can guide behavior, providing directionality (like withdrawal or approach), energy and motivational salience, or urgency (6, 7). When integration is low, affect is less likely to be experienced as a source of information or motivation, instead presenting as undifferentiated arousal with no clear source, purpose or behavioral imperative. A high level of affect integration can therefore be seen as a prerequisite for an adaptive affective system, self-regulation, and a vital and healthy sense of self and agency (8).

### Related concepts

Mentalized affectivity (9), levels of emotional awareness (10), alexithymia (11) and emotional clarity (12) represent related concepts and models of affect integration with relevance for psychopathology (2). Mentalization refers to the mental processes used to make sense of one self and others as intentional beings, while mentalized affectivity specifically describes the ability to identify, process/modulate and express affect at increasingly complex levels (13). The levels of emotional awareness model (LEA) (10) describes the emergence of emotional awareness across distinct developmental stages. Higher emotional awareness is characterized by increased awareness and integration of emotions, moving away from undifferentiated percepts or bodily sensations towards differentiated, integrated, and dialectic experiences that are nuanced, contextually relative, and changeable. Alexithymia describes difficulty in identifying and differentiating emotions from bodily states or sensations, difficulty in the ability to describe emotions, a poor fantasy life, and externally oriented thinking (14). Emotional clarity is defined as the ability to identify, understand and differentiate subjective emotional experiences (12).

There are many similarities between the affect consciousness model and particularly mentalized affectivity (9, 13). They both concern the ability to perceive, think about and express affect, stressing the importance of adequate affect attunement from an early age. Difficulties with affect integration and mentalized affectivity increases risk of interpersonal problems and misunderstandings, and the concept aporetic feelings in mentalized affectivity, describing vague or confusing feelings that lack clarity and

vibrancy (9) is similar to descriptions of poorly integrated affect. However, mentalized affectivity places much larger weight on cognitive, reflective processes compared to the affect consciousness model, where affect is the main organizing force of human mental states and behavior. Related to emotional awareness, alexithymia, and emotional clarity, the affect consciousness model also offers a more finely nuanced assessment of affect integration.

### Affect integration and psychopathology in children

So far, lower emotional awareness and expressivity (15) and lower identification of emotion (16) have been tied to more internalizing symptoms in school-children. Emotional clarity has been found to offer protection against childhood depression (17), while alexithymia is an important correlate of mental health problems in adolescence that may increase high-risk behaviors (18). Using the affect consciousness interview (ACI) for children, Taarvig et al. (3) found that higher affect integration was linked to better social competency and fewer psychopathology symptoms in 11-year old children with internalizing difficulties. Another study exploring a subset of the same data (19) found lower integration of particularly fear, shame, guilt, and anger in anxious children.

To our knowledge, no studies have yet investigated whether children with internalizing difficulties show lower affect integration globally and across the dimensions measured with the ACI compared to children without internalizing problems. It is unclear whether they would differ in their degree of affect integration across both negative and positive affects or if there is a distinction according to prevalence. The higher prevalence of negative emotions such as fear or sadness in internalizing difficulties could be related to lower integration of negative affect. However, adults show that the opposite pattern is possible, with heightened emotional awareness (indicating higher integration) of anger and fear in generalized anxiety (20). Therefore, the aim of this study was to investigate differences in affect integration between children presenting with and without internalizing problems.

### Hypotheses

We expect children with internalizing difficulties to show lower affect integration than children without internalizing difficulties, along both experiential and expressive dimensions. We expect scores on the ACI to show internal consistency overall, with more variation on the level of individual affects.

### Method

The study was a collaboration between two child and adolescent mental health outpatient clinics in

Norway. All procedures performed were in accordance with the national research ethics committees' ethical standards and the 1964 Helsinki Declaration. Participants were given written and oral explanations of procedures, aims, and background for the project, and parents gave written consent. The study was part of a larger study investigating alternate ways of assessing psychotherapeutic change, including psychophysiological measures and affect integration. Some of the subjects and procedures have been described earlier (21, 22). The children were assessed at the start of the project. The children with internalizing problems were also reassessed following 13 weekly sessions of time-limited intersubjective child therapy (23) and the controls after a comparative wait period.

## Subjects

### *Clinical group*

Children between 9 and 13 years were recruited to the project through information to local psychiatric and social services, school nurses, general practitioner doctors, and from referrals to the two clinics. Inclusion in the clinical group called for elevated (borderline or clinical) internalizing symptoms on the child behavior checklist (CBCL), a parent rating scale for common childhood symptoms (24), as well as a clear clinical description of internalizing difficulties (anxious, depressive or mixed symptomatology) obtained through information from parents. Two experienced child psychologists evaluated the children before inclusion. Forty children were considered. One was too young, and four children did not show elevated CBCL-scores. One child was not interviewed due to scheduling problems. One child was interviewed but subsequently excluded due to signs of possible psychosis. The final group consisted of 33 children (18 girls).

### **Control group**

Inclusion in the control group called for children with typical range CBCL-scores with no previous referral to mental health services. The children were recruited through parent-meetings at schools and convenience sampling. Twenty-eight children were considered for inclusion. One was excluded due to an earlier referral for suspected developmental disorder. Two were excluded due to elevated CBCL-scores, and one could not be scheduled to participate. Twenty-four children were included in the control group (13 girls).

### **Demographics**

Ten children from the clinical group lived in Oslo; the remainder of the children were from Trondheim. Both are urban areas of Norway. Mean age in the

clinical group was 10.91 years (SD 1.18) and 10.23 years (SD 1.19) in the control group. The control children were slightly younger than the children in the clinical group (Mann Whitney  $U = 259.0$ ,  $p = .027$ ), meaning that the clinical group may have had a small developmental advantage over the control group. In the clinical group, 24 mothers and 20 fathers had completed higher education defined as at least 2 years in university or college, compared to 22 mothers and 20 fathers in the control group. There was no significant difference in maternal ( $U = 320.0$ ,  $p = .110$ ) or paternal education ( $U = 275.0$ ,  $p = .092$ ) although there was a tendency towards higher parental education in the control group.

## **Assessment of affect integration**

### *The Affect Consciousness Interview*

Affect integration was assessed using the Affect Consciousness Interview (ACI), a semi-structured clinical interview (25) available for children (3). Affect integration in the ACI is operationalized as the "degrees of awareness, tolerance, emotional /nonverbal and conceptual expressivity" across a set of affective states. The ACI has shown good reliability and validity (2, 3).

The interview for this study assessed ten different affective categories: (1) Interest/Excitement, (2) Enjoyment/Joy, (3) Fear/Panic, (4) Anger/Rage, (5) Disgust/Contempt, (6) Shame/Humiliation, (7) Sadness/Despair, (8) Envy/Jealousy, (9) Guilt/Remorse, and (10) Tenderness/Care (26). Our sample included slightly younger children than previously assessed (3). Initial pilot-testing of the interview with children in our age group showed that many had difficulties understanding Disgust/Contempt. Disgust/Contempt was therefore excluded.

### **Interview-situation**

The ACI-interviews took place after measurements of heart rate. These measurements were conducted in a calm environment and included 5 minutes of rest, a 5-min cartoon with sad content and 2 minutes of silent rest after the cartoon. The procedure has been described previously for a subset of the children (22). The ACI-interviews took place in a quiet room, and the children were offered something to eat and drink before the interview.

During the interview, the interviewer focused on one affective category at a time, sequentially. Exploration of each affective category started with asking the child to describe a situation that makes them feel interested, joyful (etc.), before exploring the four dimensions for the focal affect. The dimension *Awareness* refers to the awareness of, attention to, and recognition of mental and bodily cues of affect. Here the interviewer asked how the

child would notice that they become interested (etc.), focusing on both physical and mental aspects. The dimension *Tolerance* refers to the effects and impact of affective activation on the person and the availability of strategies (voluntary and involuntary) to regulate and manage affect. Tolerance also refers to the ability to infer meaningful information about the self, others, and the world from affect. To assess tolerance the child was asked how it is for them to feel this way. To what extent can they carry or handle the affect, let it influence them and use it as a signal? The dimension *Emotional Expressivity* describes the person's capacity to acknowledge and show clear and nuanced affect nonverbally. Here the child was asked to describe how they express the focal affect in relation to significant others, strangers and when alone, focusing on facial expressions, voice, posture, respiration and similar aspects of nonverbal affective communication. Finally, *Conceptual Expressivity* refers to how well the child can acknowledge and verbally articulate affect in a clear and nuanced fashion (19, 25). Here the interviewer asked the child to share how they would express the affect in words.

### Scoring

Each affect was scored on a 9-point scale across the four dimensions (Awareness, Tolerance, and Emotional and Conceptual Expressivity). A score of 1 is the lowest attainable score, while 9 is the highest, indicating higher integration. In a small sample of slightly older children with anxiety (mean age 11.5), a score at/below 4 was considered low (19). A global Affect Consciousness score was calculated as a mean of scores from all nine affects across the four dimensions. This score is assumed to assess overall affect integration (3). Next, we calculated the means of the four dimensions across all affects. These scores are believed to assess overall levels of the dimensions. Finally, integration of individual affect was calculated for each affect as the mean score across all four dimensions.

### Rating and interrater reliability

The primary interviewer/rater was a clinical psychologist with decades of experience using the adult ACI and extensive experience in child and adolescent psychology. The rater studied a manual for the ACI for children (26). The interviews were scored during and after the interviews. Ten of the interviews took place where only participants with internalizing problems were assessed, meaning status was implied. A blinded second rater was used to minimize the risk of bias. The blind rater was given the same manual for the ACI as the primary rater and asked to blindly rate nine of the interviews based on audiotapes. Interrater-reliability between the primary rater and the blinded rater was assessed by a two-way

random intraclass correlation coefficient which ranged from good to excellent: Affect Consciousness (.97), Awareness (.96), Tolerance (.89), Emotional Expressivity (.89), Conceptual Expressivity (.99), Interest/Excitement (.84), Enjoyment/Joy (.97), Fear/Panic (.90), Anger/Rage (.96), Shame/Humiliation (.99), Sadness/Despair (.95), Envy/Jealousy (.98), Guilt/Remorse (.98) and Tenderness/Care (.82).

### Statistical analysis

The data was checked for extreme outliers, defined as scores more than three standard deviations away from the mean. Two data points were considered outliers and removed. The data was inspected for normalcy, skew, and kurtosis using the explore-function in SPSS (IBM, version 25). There was an indication of slight non-normality in some variables, so Mann-Whitney U-tests were used to investigate group differences. Effect size is presented as Cohen's  $d$  and  $\eta^2$  calculated from U values and sample size (27). A visual representation of the results was made in R and R-studio. Spearman's ranked order correlations were used for exploration of relationships between the ACI variables. Correlation coefficients were interpreted as small (.10), moderate (.30), large (.50), and very large (.90).

### Results

The children with internalizing problems displayed lower affect integration on all ACI scores, for positive and negative affects. Effect sizes were generally large, showing the largest differences for Affect Consciousness and Emotional Expressivity. When looking at individual affects, the groups were most different in integration of Anger/Rage, followed by Sadness/Despair. The range of individual scores on the dimensions spanned from a low score of 1.1 (Conceptual Expressivity, clinical group) to a high score of 6.0 (Emotional Expressivity, control group). See Table 1 for details and descriptive statistics, and Figure 1a and 1b for visual representations of means and between-group differences.

Spearman ranked order correlation coefficients showed large (.60) to very large (.94) positive correlations between overall affect integration as assessed by the Affect Consciousness score and the four dimensions, see Table 2. There was considerably more variation in the correlation coefficients between affective categories, which ranged from non-significant to large (.66). Affects tended towards stronger correlation with other affects of the same valence. See Table 3 for details.

**TABLE 1.** Descriptive statistics and between-group differences

Variable	Internalizing group			Control group			Between-group differences		Effect sizes	
	n	Mean	Sd	n	Mean	Sd	U	p	$\eta^2$	d
Internalizing problems	33	68.70	9.0	24	46.92	8.53	30.0	<.001**	0.61	2.52
Affect Consciousness <sup>1</sup>	33	3.28	0.62	24	4.25	0.56	87.5	<.001**	0.44	1.76
Awareness <sup>2</sup>	33	3.67	0.82	24	4.56	0.60	152.0	<.001**	0.27	1.23
Tolerance	32	3.71	0.58	24	4.54	0.51	110.5	<.001**	0.37	1.52
Emotional Expressivity	33	3.51	0.67	24	4.69	0.64	73.0	<.001**	0.48	1.91
Conceptual Expressivity	33	2.30	0.67	24	3.20	0.79	151.5	<.001**	0.27	1.23
Interest/Excitement <sup>3</sup>	33	3.82	1.07	24	4.78	0.67	179.5	<.001**	0.22	1.05
Enjoyment/Joy	33	3.97	1.03	24	4.81	0.48	181.5	<.001**	0.21	1.03
Fear/Panic	33	3.27	0.98	24	4.27	0.90	171.0	<.001**	0.23	1.10
Anger/Rage	33	3.14	0.76	24	4.40	0.90	118.5	<.001**	0.35	1.48
Shame/Humiliation	33	2.26	0.67	23	3.08	1.04	201.5	.003*	0.16	0.86
Sadness/Despair	33	3.02	0.79	24	4.10	0.97	155.5	<.001**	0.27	1.20
Envy/Jealousy	33	2.46	1.15	24	3.43	1.43	244.0	.014*	0.11	0.69
Guilt/Remorse	33	3.12	1.15	24	3.98	1.15	234.0	.009*	0.12	0.74
Tenderness/Care	33	4.46	1.17	24	5.30	0.63	168.0	<.001**	0.24	1.12

Notes. U: Mann-Whitney U-test

\* $p \leq .05$ ; \*\* $p < .001$

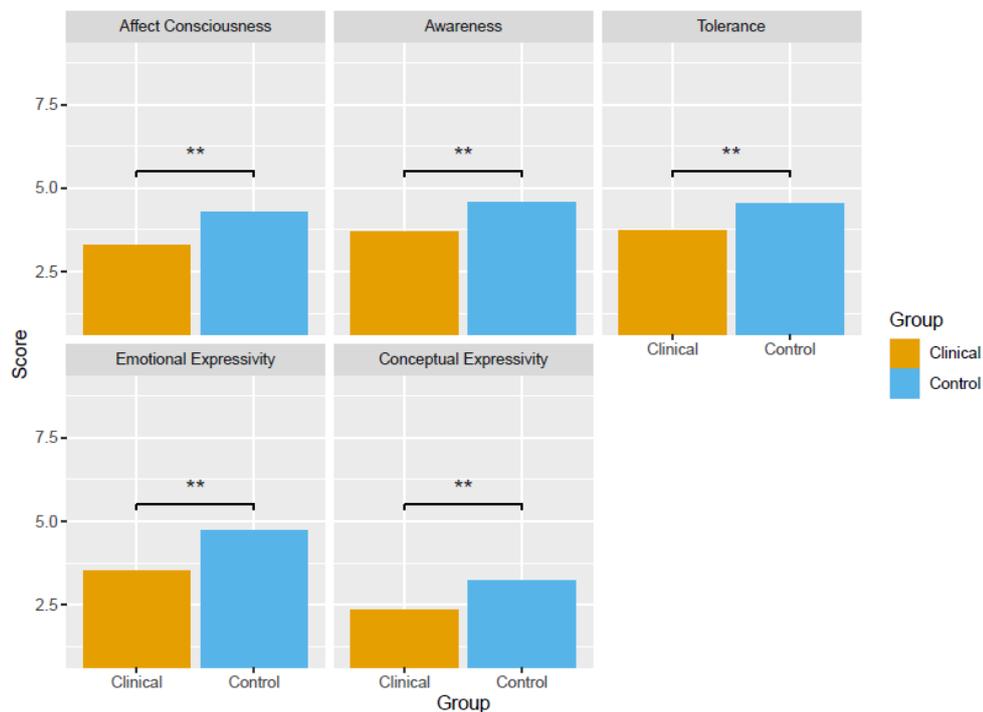
<sup>1</sup>The Affect Consciousness score was calculated as a mean of all scores

<sup>2</sup>The scores for dimensions Awareness, Tolerance, Emotional Expressivity and Conceptual Expressivity were calculated as the mean for each dimension across all affects

<sup>3</sup>Integration of individual affective categories were calculated as the mean across the four dimensions

**Figure 1.** Visual representations of between-group differences in affect integration

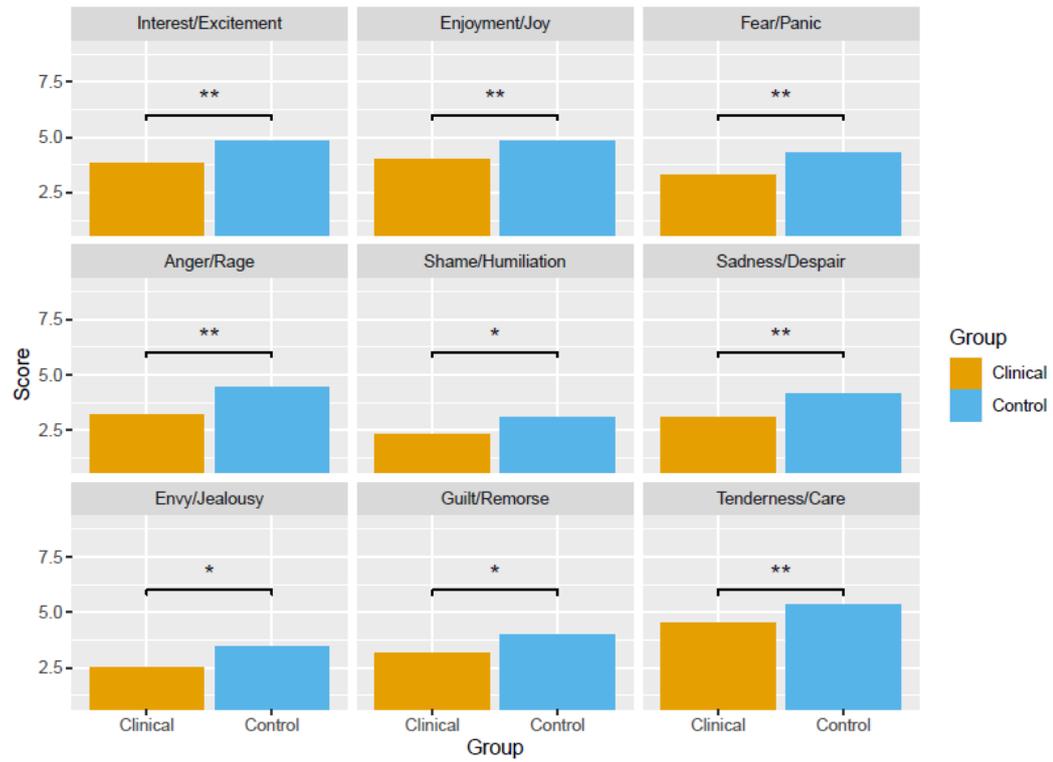
a) Differences in affect integration overall and for dimensions Awareness, Tolerance, Emotional Expressivity and Conceptual Expressivity



Note. \* $p \leq .05$ ; \*\* $p < .001$

**Figure 1.** Visual representations of between-group differences in affect integration

b) Differences in integration of affects



Note. \* $p \leq .05$ ; \*\* $p < .001$

**TABLE 2.** Correlations between overall affect integration and dimensions

Variable	n	Affect Consciousness	Awareness	Tolerance	Emotional Expressivity	Conceptual Expressivity
Affect Consciousness	57	-				
Awareness	57	.89**	-			
Tolerance	56	.90**	.80**	-		
Emotional Expressivity	57	.94**	.81**	.82**	-	
Conceptual Expressivity	57	.85**	.60**	.66**	.73**	-

Note: \* $p \leq .05$ ; \*\* $p < .001$

**TABLE 3.** Correlations between affective categories

Variable	n	Interest Excitement	Enjoyment Joy	Fear Panic	Anger Rage	Shame Humiliation	Sadness Despair	Envy Jealousy	Guilt Remorse	Tenderness Care
Interest Excitement	57	-								
Enjoyment Joy	57	.66**	-							
Fear Panic	57	.39*	.43**	-						
Anger Rage	57	.36*	.22	.66**	-					
Shame Humiliation	56	.26	.37*	.37*	.28*	-				
Sadness Despair	57	.50**	.38*	.50**	.50**	.42*	-			
Envy Jealousy	57	.44**	.49**	.41*	.23	.30*	.25	-		
Guilt Remorse	57	.45**	.50**	.36*	.24	.40*	.52**	.41**	-	
Tenderness Care	57	.58**	.51**	.35*	.40*	.37*	.49**	.39*	.33*	-

Note. \* $p \leq .05$ ; \*\* $p < .001$

## Discussion

### *Correlations*

The dimensions Awareness, Tolerance and Emotional and Conceptual Expressivity were all strongly correlated with each other and with the Affect Consciousness score (representing overall affect integration). The strongest relationship was between Affect Consciousness and Emotional Expressivity. Awareness and Conceptual Expressivity showed the lowest correlation, and are also considered developmentally and maturationally furthest apart (25). The spread of correlations was wider when considering the level of individual affects, which ranged from non-significant/weak to large. Generally, integration of positive affects showed the strongest relationship to integration of other positive affects, while the same was the case for negative affects. The strongest correlations were between Interest/Excitement and Enjoyment/Joy, and between Fear/Panic and Anger/Rage, corresponding to the motivational drives of approach and avoidance.

The results indicate that the ACI provides information that is highly consistent on an overall, dimensional level, with more nuanced information on the level of individual affect. The results were consistent with the hypotheses and corresponds to earlier findings indicating that the Affect Consciousness score and the four dimensions gives the best overall view of affect integration, while a consideration of integration of individual affects can give clinically useful information on an individual level (2, 19, 25).

### **Differences in affect integration in children with and without internalizing problems**

The ACI scores for the children with internalizing problems were comparable to those found in slightly older children with internalizing problems (3). Consistent with the initial hypotheses the children with internalizing problems scored significantly lower on all ACI measures compared to the controls, including both experiential and expressive aspects of affect integration. The significantly lower Affect Consciousness score, representing overall affect integration, indicates that the differences between the internalizing and control children were widespread.

The largest difference between the groups was in the dimension Emotional Expressivity. As children are particularly reliant on nonverbal emotional communication for their practical and emotional needs, emotional expressivity may be an especially important aspect of children's mental health (28, 29). Lower integration of emotional expressivity could reduce chances of emotional needs being understood and met, increasing the risk of developmental deficits

and further difficulties with affect integration. The children with internalizing problems also showed reduced awareness of and tolerance for affective cues and activation compared to the controls. This means they were less able to both notice and stay with affective activation and less able to use affect as a meaningful source of information. The children with internalizing problems also showed a lower capacity for verbal expressivity. The results indicate that a focus on affect integration along all dimensions, from awareness to non-verbal and verbal expression, may be warranted.

A broad focus on affect integration is further supported by the fact that the children with internalizing problems showed lower integration of all nine affective categories compared to the controls. Anger/Rage differed the most, mirroring earlier results. For instance, Taarvig et al. (19) found difficulties with integration of anger in their sample of anxious children, while Zeman et al. (16) found that lower awareness and greater inhibition of anger predicted more internalizing symptoms. In the affect consciousness model, emotions outside of awareness cannot be efficiently expressed and dealt with in the interpersonal realm, instead lingering unresolved in the body and self (4). The lower integration of Anger/Rage in the children with internalizing problems can therefore be interpreted as a lower capacity to effectively recognize and deal with situations triggering angry or rageful affect, leading to a lower chance of resolution and an increased risk of psychopathology. In line with this interpretation higher emotional clarity has been shown to buffer the relationship between interpersonal stressors and depression in children in an earlier study (17).

The second most divergent affect was Sadness/Despair. The children also differed in their integration of Fear/Panic and the remaining negative affects (Shame/Humiliation, Envy/Jalousy and Guilt/Remorse). This indicates that the negative affects were harder to recognize, tolerate, regulate, and adaptively use, express, and share for the children with internalizing problems compared to the controls. This corresponds with the affect consciousness model's idea of the poorly-integrated self as a self leached of vitality, meaningful direction, and genuine interpersonal connection and communication (8). Low integration of affect is considered at the core of this impoverished self, creating a disconnect between inner and outer realities, diminishing the experience of relevance, coherence, and community with others, resulting in a heightened risk of psychopathology.

The lower integration of sadness and fear in the children with internalizing problems makes further sense if one considers internalizing psychopathology as a problem of regulation (30). When affects are well

integrated, they provide clarity and motivation to navigate and regulate according to internal and external demands (7, 31). For the children with internalizing problems, lower integration of affective states like sadness or fear can signify a heightened risk of less efficient self-regulation in triggering situations. This is because less integrated affect can be experienced as undifferentiated, confusing or threatening bodily arousal or agitation rather than as a source of information and motivational energy (akin to “aporetic feelings” in mentalized affectivity). If affect does not provide clarity or motivation for action (like seeking out comfort or reassurance), the risk of being sucked into, or stuck in, dysregulated affective states increases.

This vulnerability for dysregulation likely includes physiological processes. Flexible parasympathetic regulation of sympathetic nervous system arousal is essential for adaptive self-regulation and psychological health (32). Reactive heart rate variability is a marker of parasympathetic regulation and is believed to reflect a person’s ability to flexibly modulate and mobilize sympathetically mediated resources (such as increased heart rate and oxygen-metabolism) in the face of demands (33). In an earlier investigation, a subset of the children was assessed for reactive heart rate variability during a sad cartoon (22). This study found lower reactive heart rate variability in the children with internalizing problems compared to the controls. The results were interpreted as a potential lower capacity for adaptive reaction in the face of something sad. Seen together, the results indicate a lower capacity for self-regulation in the face of negative affect for children with internalizing problems compared to control children.

Importantly, our study also indicates that children with internalizing problems might be subject to less efficient correction from positive stimuli or affects that could help them exit or avoid more negative emotions. The children with internalizing problems showed lower integration across all positive affective categories assessed (Interest/Excitement, Enjoyment/Joy and Tenderness/Care) compared to the controls. The lower integration of positive affect in the clinical children may stem from less experience with positive feelings or be secondary to anxiety or depression. It may also represent a possible causal factor, particularly when considering causality within a circular, developmental frame, where something can function as both cause and effect at different timescales (34). Positive affects are essential for exploratory, playful, and intimate relational behaviors and represent a critical driving force in development that can be considered directly antidotal to anxiety or depression (35-37). Less integrated affects are less accessible and provide lower adaptive and

motivational guidance. Put simply, if you cannot recognize signs of potential excitement, joy, or care, how can you reliably approach these states in your actions or relationships? Sensitivity to naturally occurring rewards (like social interaction) is an important motivation to move in new and more adaptive directions that may reduce the risk of psychopathology (30, 38). Lower integration of positive affect in children with internalizing problems may signify a lower capacity to recognize and seek out stimuli, situations, or relationships associated with positive affect and opportunity for reward, a phenomenon known from adult depression (39). Potential deficits in the integration of positive affect in children should therefore be given more attention in both research and clinical work.

The results also imply lower emotional complexity in the children with internalizing problems compared to the controls. Emotional complexity comprises both higher awareness of and access to affective states and more nuanced and mature expressions of affect and may increase resilience to stress and negative life events (40, 41). A higher (or more optimal) degree of complexity has been associated with health and self-regulation across several physiological systems and psychological modalities (42, 43), including the emotional domain (40) and the sense of self (44), indicating that complexity is an overall marker of health.

Finally, the results are interesting in light of studies showing that reduced affect integration is associated with psychopathology in adulthood (2, 25, 45), indicating that the negative relationship between psychopathology and affect integration may persist. The apparent stability of the association between affect integration and psychopathology further highlights the importance of assessment and potential clinical interventions from an early age, particularly given possible compounding or transactional effects, where difficulties in one domain reinforces difficulties in the other.

### **Clinical significance**

#### *Affect integration as a guide for therapy*

Studies on adults have shown that assessment of affect integration with the ACI can be used to choose and plan appropriate therapeutic approaches with patients (5, 10, 46). For instance, the low awareness and tolerance for affect in patients with low affect integration may interfere with the ability to profit from forms of psychotherapy where the patient must be able to notice and stay in an emotional experience over time. In line with this, Gude and colleagues (46) found that higher pre-treatment levels of affect integration was related to reduced avoidance of emotionally painful topics in therapy, along with increased therapeutic benefit from schema-therapy.

Patients with low initial affect integration may also benefit more from more open-ended, long-term interventions than patients with higher initial affect integration (47). This suggests that an early assessment of affect integration could help select patients more likely to benefit from therapeutic approaches where painful emotions, or exposure to emotions, are part of the therapeutic focus. It further means that patients with low levels of affect integration may need interventions aimed at strengthening integration, tolerance or access to emotions early on in their therapy, using more open-ended or long-term interventions. Individual profiles of affect integration can highlight areas of importance for therapy, such as particularly less integrated affects, or areas of relative strength than can be used as resources to build upon.

Our results show that affect integration is a meaningful concept when considering internalizing psychopathology in children as well as adults. The results suggest that interventions aimed at increasing the motivational, vitalizing and communicative impact of typically internalizing affects (like sadness or fear) should be considered in psychotherapy with children with internalizing problems. However, the results also highlight the importance of addressing integration of other negative affects, like anger, which may strengthen the ability to navigate interpersonal relationships, buffering relational stressors and psychopathology. Integration of positive affect is another promising target in therapy with children with internalizing problems, calling for a focus on positive affect and naturally occurring rewards like effort, play, or social interaction. Interventions aimed at increasing integration of positive affect, such as helping the child gain an increased awareness of potentially rewarding stimuli, could help stimulate more adaptive behavior (38) and fuel positive development. Our results further imply that a strengthening of the child's nonverbal and verbal affective communication and the caregivers' ability to understand the child's affective signals and needs is important for children with internalizing problems. This includes a focus on nonverbal, affective attunement and communication (6, 28, 48).

### **Increasing affect integration therapeutically: lessons from infant psychology**

Safe and nurturing social relationships are important for general brain development (28, 29, 49) and integration of affect (5, 18, 50, 51). Particularly the presence of an attuned and emotionally competent partner providing sensitive, multimodal input can strengthen the integration of relational and affective

experiences in children (5, 28, 29, 52). For instance, when parents soothe a distraught infant, this often takes place through synchronized multimodal sensory input. The experience may include a soothing, melodic voice, conceptual labeling of the child's presumed affective state and sensations (*"oh, you're sad, it hurts to be so sad"*), tactile stimulation (hugging, stroking) and rhythmic input (song, bouncing, rhythmic patting), providing an enveloping and embodied experience where multiple areas of the brain receive input that is synchronized in timing, intensity, and affective and conceptual content (53, 54). By mirroring and labeling the (presumed) affect and adjoining sensations, a link is gradually built between vague, initially undifferentiated bodily sensations and a more complex and mature concept of an affective state recognized and expressed as a part of "me, in the world". Meanwhile, the caregiver models adaptive ways to tolerate, express, and regulate the affect, instilling the safety of not being isolated and helpless in whatever one is experiencing. Thus, over time and repetition, the infant's fragmented and multi-faceted experiences are integrated into a whole, and a sense of an embodied self in the world can arise (55).

Based on principles from empirical infant psychology, we suggest that psychotherapy for children with low affect integration should aim to strengthen connections between multiple brain areas and modalities and between the brain and body, highlighting affective experiences and interactions. This type of intervention should mimic the multimodality of early social experiences, within a safe relational frame. Time-limited intersubjective child psychotherapy represents one such approach.

### **Time-limited intersubjective child psychotherapy as an affect-integrative approach**

Time-limited<sup>1</sup> intersubjective child psychotherapy is a therapeutic approach developed in recent decades in Norway that explicitly aims to expand and integrate positive and negative affective experiences within a safe, relational, and often playful frame (23, 56). Here the therapist guides and supports the child in experiencing and tolerating higher states of affective arousal than when alone, always providing a frame of meaning, structure, and safety that is both embodied and relationally embedded (23). The approach integrates knowledge from infant research that demonstrates the significance of targeting multimodal intersubjective micro-processes to bring awareness to and enhance emotional experiences. Play and exploration of rhythm or nonverbal properties of being together and knowing the other

<sup>1</sup> The phrase "time-limited" in time-limited intersubjective child psychotherapy does not imply that it is a strict short-term

therapy, but reflects that the therapy consists of time-bound segments of around 12 sessions that can be repeated as needed.

(and making oneself known) is an integral part of time-limited intersubjective child psychotherapy. An explicit goal in time-limited intersubjective child psychotherapy is facilitating recognition and expression of affective states, consistent with the affect consciousness model.

Our results showed that the children with internalizing problems were particularly low on the dimension Emotional Expressivity, highlighting the importance of addressing the ability to express affect. In support of time-limited intersubjective child psychotherapy as a way of increasing emotional expressivity, Haugvik and Johns (57) found that children undergoing time-limited intersubjective child psychotherapy showed increased parent-reported clarity in their emotional communication of negative and positive affects, as well as symptom relief. To further investigate the effects of time-limited intersubjective child psychotherapy on emotional expressivity, a qualitative microanalytic study was carried out on six children in the present study during and after time-limited intersubjective therapy (58). The ACI for these six children showed improved affect integration after therapy, including increased emotional expressivity. Characteristics of therapeutic communication leading to increased emotional expressivity in therapy were systematically recorded through video microanalysis inspired by empirical infant research. Results showed that the therapists' synchronization to the child's signals was a significant factor. Of special importance was capturing and adjusting to mismatches and communication errors, both in nonverbal bodily communication such as tempo and intensity and verbally. This further implies that the individual child's experience of emotional communication through synchronization and affect attunement is central to the experience of being understood and thereby central to affect integration and a crucial component of child psychotherapy.

### Limitations

The study had a small sample size. We also did not control for verbal intelligence or working memory, which may influence affect integration (3, 40).

### Conclusion

In light of the important motivational and vitalizing role of affect, deficits in affect integration may represent a causal or sustaining factor in psychopathology. The affect consciousness interview offers an in-depth assessment of affect integration with relevance for understanding and treating internalizing problems in children. The results from this study indicate widespread differences in affect integration in children with internalizing problems compared to peers. The study is among the first

studies to investigate the effects of normal and pathological development on affect integration, underlining the importance of considering affect integration in clinical work with children. The children with internalizing problems showed lower affective awareness, tolerance, and nonverbal and conceptual expressivity than the controls. They differed most in the integration of emotional expressivity, anger, and sadness, but showed lower integration of all affects assessed, positive as well as negative. The results mirror results from other studies across subjects and concepts linking different aspects of affect integration with internalizing psychopathology (3, 15-19). Individual assessment of affect integration with the ACI can potentially help guide choice of psychotherapeutic intervention and focus, and increase benefit from therapy. The ACI also has potential as an informative effect-measure in psychotherapeutic processes or research, going beyond mere symptom relief. If affect integration is low, interventions explicitly focused on strengthening affect integration may be an important starting point and interventions mimicking rich and multi-faceted early experiences within a safe relational frame may be particularly beneficial. Time-limited intersubjective child psychotherapy represents one approach that may strengthen affect integration in children.

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