

Document S1: Detailed description of the FCAAS scales

The FCAAS includes 10 scales, six of which assess the family triad (scales 1, 2, 4, 5, 6, 7), and four of which assess some relevant aspects of family subsystems (scales 3, 8, and 9 for the coparental subsystem; scale 10 for the adolescent subsystem). Because the various levels of analysis, there is some overlap at the indicator level between the triadic and subsystem scales. Each scale can be assigned a score ranging from 1 (inappropriate) to 5 (appropriate), with a score of 3 representing a moderate score. Scores 2 and 4 can be assigned when the coder deems them adequate to add nuance to the ratings. Detailed coding criteria can be found in the unpublished coding manual [please contact the first author for coding manual and training; 1]. In this article, the most relevant indicators of each scale are described in moderate details.

Scale 1: Postures & gazes

The coder assesses the degree of engagement in the interaction based on the non-verbal and bodily signals that family members give each other. Non-verbal cues include the orientation of the pelvis, torso, and gaze inside or outside the interaction triangle to signal engagement or disengagement, respectively [2-5]. Diverted gazes and facial expressions of the third-party partners are particularly relevant to assess whether they are “simply present” (i.e., facial expression indicates attention and echoes the exchanges between active partners) or absent instead (e.g., inexpressive, or frozen face). In addition, mutual gaze and eye contact between active partners is indicative of social (dis)engagement and (lack of) participation in the interaction. Adequate social engagement is considered a fundamental prerequisite for optimal collaboration throughout the interaction [6,7].

Scale 2: Turn-taking

The coder also assesses the degree of engagement in the interaction but based on speech or verbal cues related to the sharing of the floor, which can hopefully allow inclusion of self and the other partners in the interaction. Ideally, each family member speaks frequently, addresses speech to the other members, and asks questions in case they disengage (no partner is ignored). These re-inclusive questions are ideally answered. Most importantly, there should be no or few monologs as they risk leaving little space for others to participate. In addition, interruptions should be infrequent or at least collaborative [directed at helping the speaker, e.g., sentence finishing; 8] rather than competitive [directed at taking the floor or preventing the speaker to complete their thought; 9,10].

Scale 3: Mutual respect for coparenting roles; coparental subsystem

The coder assesses the parents’ ability to be temporarily excluded (third-party role) and to make room for the other parent and his/her relationship with the child (Fivaz-Depeursinge & Corboz-Warnery, 1999). Interferences occur when the third-party parent is non-compliant regarding LTP-CDT instructions and enters the discussion between the other parent and the adolescent instead of remaining “simply present”. Interferences can be minor (e.g., muffled laughter) or major (e.g., long comment) and verbal (e.g., advice) or non-verbal (e.g., nod). While some interferences are supportive (often minor and not very intrusive) if they do not prevent the dyadic discussion from continuing, all of them are arbitrarily considered disruptive in the coding. In addition, interference can sometimes lead to the interruption of the on-going interaction, or on the contrary, to the integration of the third-party partner into the interaction. Another useful indicator of this scale is the direction of the pelvis, torso, and gazes, which should be directed at the active partner(s) rather than at the third-party parent. These various indicators can be signs of coparenting difficulties or of potential competition between the coparents to win the teenager’s attention, favor, or support. Note: Only parents’ behaviors during LTP-CDT parts I, II, and IV apply to this scale, whereas respect for interactive roles by the adolescent and the parents during part III is coded in the role reversal scale (scale 7).

Scale 4: Conflict resolution

coder assesses both the process and outcome of interpersonal conflict resolution. Ideally, such a process usually goes through various stages: definition of the problem, exploration of the problem, co-construction of a solution to the problem, acceptance of a solution, and finally commitment [11-13]. Throughout these stages, the coder evaluates whether the family members negotiate rather than confront each other. Ideally, partners co-construct the discussion with a lot of dialog and trialogue, enrich each other's ideas, and co-construct a solution to the problem. For proposed solutions to be of good quality, they must: 1) be directly linked to the problem to be solved; 2) if possible, represent a compromise between the family members in disagreement; 3) be specific; 4) be expressed in positive terms (e.g., acquiring a new behavior or increasing the frequency of a behavior, rather than "no longer doing something"); 5) be concretely achievable for each partner. These various criteria allow the assessment the presence of triadic cooperation during the conflict resolution.

Scale 5: Affective climate

The coder assesses the general tone of affective exchanges, as well as the appropriateness of the intensity and timing of the affects expressed in relation to the interpersonal content of the interaction (Fivaz-Depeursinge & Corboz-Warnery, 1999). In other words, this scale assesses the circularity of affects (are partners in affective contact with each other?). Triadic affect sharing can occur when all three family members look at each other and express the same affect, positive or negative (joy through a laugh or a smile, sadness through a facial expression, anger through a hostile look, grimaces, etc.) at the same time or within a short window of time. A warm affective climate is revealed by the presence of positive affect shared between family members, at both dyadic and triadic levels (mutual smiles, jokes followed by laughter, affectionate gestures, compliments, backchanneling). Conversely, the presence of confrontation, negative or hostile remarks, mockery, and sarcastic or ironic comments indicates a tense affective climate. A tense affective climate can also be revealed through the expression of over-played positive affect, such as exaggerated laughter. This over-positivity may reveal unease on the part of family members or represent an attempt to mask underlying relational tensions during the discussion. Ideally, there is at least one triadic moment in which all three partners genuinely share positive affects. Another indicator of the affective climate is the presence of criticism [either constructive or destructive; 14] and the attitude in response to the criticism, which can be either open (e.g., readiness to consider the other's perspective, acceptance of one's share of responsibility, etc.) or defensive (e.g., denial of the error, countercriticism, self-victimization, etc.) [8,11]. The presence of contempt, which can take the form of destructive criticism or behavior such as rolling one's eyes, is also an important indicator for assessing the family's affective climate.

Scale 6: Mentalization

The coder assesses whether parents and adolescents correctly verbalize and interpret their own mental states (self-mentalization) and those of others (other-mentalization). Mentalization, or reflective function, refers to the ability to conceive of one's own behavior or that of others as arising from certain mental states, such as emotions, intentions, needs, wants, desires, or beliefs [15]. Other-mentalization can be considered positive if it serves to attribute positive mental states (e.g., good intentions) and negative if it serves to attribute negative mental states (e.g., bad intentions). According to Vanwoerden [16], mentalization can take different, sometimes problematic forms, such as hypermentalization (i.e., over-attribution of mental states with a high degree of certainty, sensitivity to partner cues and suspicion) and hypomentalization (i.e., under-attribution of mental states to observable behaviors, with a tendency not to use vocabulary relating to mental states). On the contrary, appropriate mentalization entails an adequate level of curiosity about mental states and is necessary for a warm affective climate in that it promotes a climate of mutual understanding, validation, and empathy between people. Note: It is important to mention that adolescents are also able to mentalize the mental states underlying their behaviors and those of their parents [17], although the latter are expected to have more developed mentalizing skills than the adolescents (i.e., they can mentalize more complexly, more precisely and more frequently). Because of their higher hierarchical role in family functioning, parents are expected to mentalize more frequently than the adolescents.

Scale 7: role reversal

This scale is particularly useful for rating families in which there is coparental or marital conflict, as this can lead to dysfunctional or at least detrimental to effective conflict resolution [18,19]. Coparental conflict can be observed during

the LTP-CDT, for example, when both parents intervene in a disunited way as the discussion progresses. When there is a high degree of conflict between the coparents, the teenager may find themselves (by themselves or at the instigation of one or both parents) in the position of regulator or arbiter of the interparental conflict. These coparental conflict-avoidance strategies can take different forms: triangulation, binding (parent-child coalition), detouring (of the conflict), and parentification [20-23]. Each of these four relational phenomena involves a form of role reversal, whereby the adolescent is the bearer of the coparental conflict and thus carries the family balance on their shoulders. These different forms of role reversal sometimes appear in succession, whereas in some cases, one of them predominates.

First, in the case of triangulation, the parents take turns trying to ally with the teenager against the other parent, putting them in a position where they can no longer express themselves without taking sides (the triangulated teenager sometimes sides with one parent, sometimes with the other). Second, the case of parent-adolescent coalition is very similar to that of triangulation, except that it is observed when the teenager takes sides and positions themselves stably and repeatedly in favor of the allied parent and against the other parent. The parent-adolescent coalition can be observed when the teenager almost systematically supports the opinion of one parent and contradicts that of the other, or when the teenager backs up the criticism that one parent makes of the other. A few knowing smiles or knowing glances can sometimes be enough to indicate an attempted or established coalition, i.e., a tacit agreement between one parent and the adolescent. Third, conflict detouring (or coparental coalition) refers to a case where the parents act together and cooperate, except that they do not do it "for" the adolescent but "against" them. This negative form of coparental cooperation does not serve the well-being of the adolescent, who becomes a scapegoat. This phenomenon serves to divert attention from the coparental conflict and allows parents to give the impression, consciously or unconsciously, that there is a good understanding between them. The coparental coalition is therefore sometimes "the only way to cooperate" [24]. Fourth, parentification refers to parental behaviors that give the teenager the role of a parent, i.e., they give the teenager excessive responsibilities, delegate their own responsibilities to the adolescent, make the teenager feel guilty for their own mistakes and shortcomings, or ask the adolescent for emotional support (the adolescent is used as a confidant or personal advisor, sometimes about coparental or marital conflicts).

Two other indicators can signal the presence of role reversal of the adolescent and are related to respect for interaction roles during parental discussion (part 3 of the LTP-CDT). First, parental behaviors, whether verbal or non-verbal (pelvis, torso, gaze geared toward the adolescent), that tend to include the adolescent in the coparental discussion can indicate role reversal, since the adolescent is included in the exchanges that only regard the coparental unit. Second, adolescent interferences (for details on interferences, see scale 3) can suggest either an inability on the part of the adolescent to remain "simply present", or an (over-)involvement in the relationship between the parents. This is especially the case when adolescent interferences occur during times of tension or when coparental or marital conflict breaks out. Adolescent interferences could be a sign of coalition or parentification, which implies that the adolescent has a role that is not their own: that of regulator of the relationships between their parents.

Scale 8: Coparenting support; coparental subsystem

The coder assesses the extent to which cooperation and support characterize the coparental subsystem [5,22,23]. Coparenting support is defined as a parental alliance in the service of the adolescent's well-being and differs from coparental coalition, in which parental cooperation is not "for" but "against" the adolescent (see scale 7). The assessment in this scale is based on both implicit (e.g., a parent showing support for the other parent's initiative) and explicit (e.g., positive feedback) supportive behaviors. Another element to be considered in this scale is the level of agreement between the coparents. Good coparenting support is often observable through a high degree of coparental agreement about parenting. Conversely, if there is a lack of agreement or even a high degree of coparental disagreement, it is important to assess whether the parents also support each other in disagreement, or in other words, whether they can coordinate despite their differing points of view.

Scale 9: Autonomy promotion; coparental subsystem

The coder assesses whether the parents' behaviors promote the adolescent's autonomy or, on the contrary, whether their behaviors seem to indicate that they would like to keep the adolescent as dependent as possible. Put differently, two elements need to be considered: autonomy-promoting behaviors and autonomy-inhibiting behaviors [25-31]. Autonomy-promoting behaviors can include showing respect for the adolescent's individuality by giving them time to

146 speak, engaging in a constructive and reasoned discussion, complimenting the adolescent, or setting and managing
147 clear but flexible limits (instead of unclear, coercive, or lax ones) that give space to negotiation. Autonomy-inhibiting
148 parental behaviors can include opposite behaviors, such as focusing solely on their own agenda without considering
149 the adolescent's perspective, demanding blind obedience, and showing controlling behaviors (e.g., giving moral les-
150 sons, inducing feelings of shame or guilt). Furthermore, autonomy promotion will greatly depend on the level of
151 granted autonomy (appropriateness based on the adolescent's age and development) and the manner in which auton-
152 omy is granted (in a warm and trusting manner, or conversely, showing distrust in the adolescent's abilities). Further-
153 more, autonomy promotion requires both parents; therefore, scores in this scale vary according to whether none, one of
154 the parents, or both promote their adolescent's autonomy.

155 156 *Scale 10: Adolescent autonomy; adolescent subsystem*

157 The coder assesses the degree of the adolescent's autonomy by considering four elements: autonomy-indicating
158 behaviors, autonomy-inhibiting behaviors, requests for autonomy, and reactions to parents' refusal to grant autonomy
159 [25-27,29,30]. The following behaviors can be indicative of adolescent autonomy: asserting oneself, one's desires, needs,
160 and ideas (i.e., using "I" affirmations, explaining one's thoughts and feelings clearly and in a balanced and constructive
161 way), disagreeing and challenging parents' ideas in a respectful manner, maintaining personal positions, proposing
162 solutions representing compromise, and so forth. Of note, disobedience or rebellion is not necessarily an indication of
163 autonomy. On the contrary, behaviors that are autonomy-inhibiting behaviors or indicative of a lack of autonomy can
164 include: making incomplete sentences, expressing oneself hesitantly, using words/phrases such as "maybe", "I do not
165 know", etc., not clearly communicating disagreement, letting others (the parents) speak for themselves, and so forth.
166 Obedience does not necessarily indicate a lack of autonomy; however, the manner of obedience is more indicative. In
167 fact, obedience can be blind (without seeking to understand and without questioning), or on the contrary, it can be free
168 (carried out in an informed, deliberate, and responsible manner). A third indicator of scale 10 is requests for autonomy,
169 although claiming autonomy does not necessarily imply the presence of autonomy. While some adolescents do not need
170 to ask for autonomy (because they feel their parents give them enough), many do need to demand independence from
171 their parents. Ideally, these demands are legitimate, i.e., appropriate and proportionate to their age and development,
172 thus testifying to their autonomy. Indeed, autonomous adolescents demonstrate a certain lucidity regarding the degree
173 of autonomy they are entitled to at their age and level of development. Fourth and last, it is also interesting to consider
174 the adolescent's reaction when parents do not accede to their request for autonomy. Autonomous adolescents will be
175 able to hear their parents' reasoning, recognize their parental authority, and adapt to it (this is not blind submission).
176 The less autonomous adolescent, on the other hand, will have more difficulty understanding their parents' point of view
177 and recognizing their parental authority. Faced with a lost cause, an adolescent with little autonomy could, for example,
178 blindly submit and agree with their parents to shorten or end the discussion, or, on the contrary, get angry and insist
179 without giving any rational arguments to make their parents listen to reason. These behaviors, while perfectly under-
180 standable and normal when faced with a disagreement with parents, may reflect a teenager's lack of autonomy.

References

1. Romet, M.; Favez, N.; Tissot, H. Family conflict and alliance assessment scales - with adolescents (FCAAS). 2023. 182
2. Goodwin, C. Restarts, pauses, and the achievement of a state of mutual gaze at turn-beginning. *Sociological inquiry* 1980, 50, 272-302, doi:10.1111/j.1475-682X.1980.tb00023.x. 183
3. Goodwin, C. *Conversational organization: Interaction between speakers and hearers*; Academic Press: New York, 1981. 184
4. Robinson, J.D. Getting down to business: Talk, gaze, and body orientation during openings of doctor-patient consultations. *Human communication research* 1998, 25, 97-123, doi:10.1111/j.1468-2958.1998.tb00438.x. 185
5. Fivaz-Depeursinge, E.; Corboz-Warnery, A. The primary triangle: A developmental systems view of mothers, fathers, and infants; Basic Books: New York, NY, 1999. 186
6. Beveridge, R.M.; Berg, C.A. Parent-adolescent collaboration: An interpersonal model for understanding optimal interactions. *Clinical Child and Family Psychology Review* 2007, 10, 25-52, doi:10.1007/s10567-006-0015-z. 187
7. Favez, N.; Frascarolo, F.; Tissot, H. The family alliance model: A way to study and characterize early family interactions. *Frontiers in Psychology* 2017, 8, doi:10.3389/fpsyg.2017.01441. 188
8. Coan, J.A.; Gottman, J.M. The specific affect coding system (SPAFF). In *Handbook of emotion elicitation and assessment*, Coan, J.A., Allen, J.J.B., Eds.; Oxford University Press: 2007; pp. 267-285. 189
9. Bell, D.C.; Bell, L.G. Micro and macro measurement of family systems concepts. *Journal of family psychology* 1989, 3, 137-157, doi:10.1037/h0080530. 190
10. Lee, K. Why Do We Overlap Each Other?: Collaborative Overlapping Talk in English as a Lingua Franca (ELF) Communication. *Korean Journal of English Language and Linguistics* 2020, 20, 613-641. 191
11. Darwiche, J.; Imesch, C.; Eira Nunes, C. Manuel de codage pour une tâche de discussion de conflit coparental. 2019. 192
12. Forbes, C.; Vuchinich, S.; Kneidler, B. Assessing families with the family problem solving code. In *Family observational coding systems: Resources for Systemic Research*, Kerig, P., Lindahl, K., Eds.; Psychology Press: 2000; pp. 59-75. 193
13. Marceau, K.; Zahn-Waxler, C.; Shirtcliff, E.A.; Schreiber, J.E.; Hastings, P.; Klimes-Dougan, B. Adolescents', mothers', and fathers' gendered coping strategies during conflict: Youth and parent influences on conflict resolution and psychopathology. *Development and Psychopathology* 2015, 27, 1025-1044, doi:10.1017/S0954579415000668. 194
14. Baron, R.A. Negative effects of destructive criticism: Impact on conflict, self-efficacy, and task performance. *Journal of applied psychology* 1988, 73, 199-207, doi:10.1037/0021-9010.73.2.199. 195
15. Fonagy, P.; Steele, M.; Steele, H.; Moran, G.S.; Higgitt, A.C. The capacity for understanding mental states: The reflective self in parent and child and its significance for security of attachment. *Infant Mental Health Journal* 1991, 12, 201-218, doi:10.1002/1097-0355(199123)12:3<201::AID-IMHJ2280120307>3.0.CO;2-7. 196
16. Vanwoerden, S. The Development and Validation of an Observational Coding System for Real-Time Parent-Adolescent Mentalizing. Doctoral dissertation, University of Houston, 2020. 197
17. Ballespi, S.; Vives, J.; Debbané, M.; Sharp, C.; Barrantes-Vidal, N. Beyond diagnosis: Mentalization and mental health from a transdiagnostic point of view in adolescents from non-clinical population. *Psychiatry Research* 2018, 270, 755-763, doi:10.1016/j.psychres.2018.10.048. 198
18. Vuchinich, S.; Vuchinich, R.; Wood, B. The Interparental Relationship and Family Problem Solving with Preadolescent Males. *Child Development* 1993, 64, 1389-1400, doi:10.1111/j.1467-8624.1993.tb02959.x. 199
19. Doane, J.A. Family Interaction and Communication Deviance in Disturbed and Normal Families: A Review of Research. *Family Process* 1978, 17, 357-376, doi:10.1111/j.1545-5300.1978.00357.x. 200
20. Brotherton, W.D. *The assessment of parental triangulation of children*; The Florida State University: 1989. 201
21. Kerr, M.E.; Bowen, M.; Kerr, M.E. *Family evaluation*; WW Norton & Company: 1988. 202
22. Minuchin, S. *Families & family therapy*; Harvard University Press: Boston, MA, 1974. 203
23. Minuchin, S.; Baker, L.; Rosman, B.L.; Liebman, R.; Milman, L.; Todd, T.C. A conceptual model of psychosomatic illness in children: Family organization and family therapy. *Archives of general psychiatry* 1975, 32, 1031-1038, doi:10.1001/arch-psyc.1975.01760260095008. 204
24. Favez, N.; Scaiola, C.L.; Tissot, H.; Darwiche, J.; Frascarolo, F. The Family Alliance Assessment Scales: Steps Toward Validity and Reliability of an Observational Assessment Tool for Early Family Interactions. *Journal of Child and Family Studies* 2011, 20, 23-37, doi:10.1007/s10826-010-9374-7. 205
25. Allen, J.P.; Hauser, S.T.; Bell, K.L.; O'Connor, T.G. Longitudinal assessment of autonomy and relatedness in adolescent-family interactions as predictors of adolescent ego development and self-esteem. *Child development* 1994, 65, 179-194, doi:10.1111/j.1467-8624.1994.tb00743.x. 206

-
26. Allen, J.P.; Hauser, S.T. Autonomy and relatedness in adolescent-family interactions as predictors of young adults' states of mind regarding attachment. *Development and Psychopathology* 1996, 8, 793-809, doi:10.1017/S0954579400007434.
27. Bengtson, P.L.; Grotevant, H.D. The individuality and connectedness Q-sort: a measure for assessing individuality and connectedness in dyadic relationships. *Personal Relationships* 1999, 6, 213-225, doi:10.1111/j.1475-6811.1999.tb00188.x.
28. Chaplin, T.M.; Sinha, R.; Simmons, J.A.; Healy, S.M.; Mayes, L.C.; Hommer, R.E.; Crowley, M.J. Parent-adolescent conflict interactions and adolescent alcohol use. *Addictive behaviors* 2012, 37, 605-612, doi:10.1016/j.addbeh.2012.01.004.
29. Maharaj, S.; Rodin, G.; Connolly, J.; Olmsted, M.; Daneman, D. Eating problems and the observed quality of mother-daughter interactions among girls with type 1 diabetes. *Journal of Consulting and Clinical Psychology* 2001, 69, 950-958, doi:10.1037/0022-006X.69.6.950.
30. Ravindran, N.; Hu, Y.; McElwain, N.L.; Telzer, E.H. Dynamics of mother-adolescent and father-adolescent autonomy and control during a conflict discussion task. *Journal of Family Psychology* 2020, 34, 312-321, doi:10.1037/fam0000588.
31. Van Petegem, S.; Baudat, S.; Zimmermann, G. Interdit d'interdire? Vers une meilleure compréhension de l'autonomie et des règles au sein des relations parents-adolescents. *Canadian Psychology/Psychologie canadienne* 2019, 60, 194-202, doi:10.1037/cap0000167.