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Exploring Family Change Processes: A Dynamic Qualitative Analysis of Family Trajectories, Change and Coordination in Child Protection Cases

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Abstract

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Keywords

Family Change Processes, Trajectories of Change, Potential for Family Change, Dynamic Systems, Child Protection

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Exploring Family Change Processes: A Dynamic Qualitative Analysis of Family Trajectories, Change and Coordination in Child Protection Cases

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This paper reports an exploratory discovery-oriented study aimed at inspecting change processes and dynamics in families referred by the Courts and Child Protection Services for family assessment in the Integrated Family Assessment and Intervention Model (IFAIM; Melo & Alarcão, 2011, 2013) due to child neglect. The families received support for change during an assessment aimed at facilitating and exploring their potential for change. The parents reported, in quantitative diaries, their family's experiences and changes inside and outside the sessions. We coded the data with a qualitative coding-scheme emergent from a preliminary qualitative exploration based on grounded theory methods and sensitizing concepts from Complexity Science and Dynamic Systems Theories. Core categories of Trajectories of States, Trajectories of Coordination and Influence and Other Coordination Effects emerged as relevant indicators to understand the families' potential for change, describing basic dynamic change processes and contributing to understand therapeutic outcomes. We discuss the implications of the results and directions for future studies. Keywords: Family Change Processes, Trajectories of Change, Potential for Family Change, Dynamic Systems, Child Protection

The study of family change in family therapy is not new (Friedlander, Wildman, Heatherington, & Sknowron, 1994; Pinosof & Winne, 2000). Nevertheless, there remain questions regarding the processes and dynamics of change (Heatherington, Friedlander, & Greenberg, 2005). Psychotherapy researchers have identified common factors associated with therapeutic success (Duncan, Miller, Wampold, & Hubble, 2010). More recently, family researchers have explored specific factors in family therapy (Friedlander, Escudero, & Heatherington, 2006; Sprenkle, Davis, & Lebow, 2009). However, there is still much to understand regarding how these factors operate and by what mechanisms change happens (Carr, 2010). Traditional research methods are poorly equipped to capture the transformations in time that occur throughout therapeutic interventions, in particular the shape and specific contours of that change (Lanrenceau, Hayes, & Feldman, 2007). Comparing pre- and post-intervention states offers little or no information about how change unfolded and how that process itself may facilitate or inhibit change. It also tells us little about how that transformation is dependent on the initial conditions and the specific forms of the pathway. Path-dependency and sensitivity to initial conditions are, among others, distinctive properties of complex dynamical systems (Guastello & Liebovitch, 2009). Dynamic methodologies are designed to capture the shape of the transformations, through time, of a given variable or state of a system and to capture the rules that underlie such transformations. They are inspired in Complexity and Dynamic Systems Theories are particularly indicated (Valsiner, Molenaar, Lyra, & Chaudhary, 2009; Van Geert, 2012) to capture the processes underlying the family's transformations (Gottman, Murray, Swanson, Tyson, & Swanson, 2005) and their complexity. They have the potential to illuminate how different initial conditions and different contours of the dynamic behaviour of variables known to be of interest to therapeutic change may relate to different types of outcomes (Van Geert, 2012). Mathematical approaches grounded in

dynamical systems theories have been used to explain the transformations occurring in many psychological and relational systems (Guastello, Koopmans, & Pincus, 2009). The work of John Gottman is paradigmatic of application of such techniques to couple's relational dynamics. Exploring the specific conditions that influence how a couple deals with conflict through time or responds to each other's influence has resulted in a body of highly significant information guiding intervention efforts (Gottmann & Gottman, 2008).

However, dynamical mathematical approaches are not always suited, particularly in early stages of research exploration, nor easily grasped by the common practitioner or social scientist.

Others have used more metaphorical and case study approaches as well as a combination of both quantitative and qualitative methods to explore, for example developmental trajectories of change of relational patterns of mother-infant interactions (Fogel, Garvey, Hsu, & West-Stroming, 2006).

Several methods have been developed and adapted in the last decades that are well suited for psychology and other social sciences (Guastello & Gregson, 2016) and used individual psychotherapy contexts to explore change processes (Ribeiro, Bento, Salgado, Stiles, & Gonçalves, 2011). For example, the state space grid method allows for the identification of the attractors of a given relational system, the tracking of the fluctuations and the identification of transitions in relational patterns (Granic, Hollenstein, Dishion, & Patterson, 2003). Dynamical methods have been used in some family intervention settings to understand the processes underlying and sustaining change at the level of interpersonal systems, in particular how it unfolds (Granic, O'Hara, Pepler, & Lewis, 2007). They may provide valuable information about the dynamics of the coordination of a dyadic interpersonal system. The exploration of the rules predicting how a given system behaves through time supports simulations regarding the conditions favouring change and the adjustment of the models for particular cases throughout interventions (Gottman et al., 2005).

It is essential to understand the core processes implicated in change and, most of all, how change unfolds, through which pathways of transformation and under which conditions. This is particularly important for field practitioners working with multichallenged families that (a) have not asked to change; (b) have children at risk or in danger who depend on that change; (c) face decisions concerning child removal or family preservation; (d) need to deal with changes at different levels (parental, couple or family level) and often in multiple areas (internal relations; relations with external systems; material resources and social condition).

The processes underlying the relation between individual and family level change are also underexplored. This issue is especially relevant in child protection cases since parental change is often constrained by changes at the global family-level and vice-versa. Therefore, assessments for child protection purposes need to address the potential for change at both these levels and their relationship. For the matter, they should include some form of intervention and therapeutic support, accompanied by an analysis of the family's responses to it (Brown & Dean, 2002; Melo & Alarcão, 2011).

However, research is still insufficient to offer concrete guidance to field professionals. Therefore, it is important to explore the factors and processes associated with different degrees of success regarding outcomes in child protection cases. Discovery oriented-studies (Mahrer & Boulet, 1999) are especially suited, particularly when aimed at building theory grounded in data (Bryan & Charmaz, 2007). Case studies approaches and exploratory methods also facilitate the exploration of the relational processes and the dynamics involved in supporting families.

The present study integrates a broader research project aimed at identifying factors and processes associated with positive natural and therapeutic change and adaptation of multichallenged families with at-risk or in-danger children. The goal of the project is to identify

and explore the processes and factors that differentiate positive and negative adaptation outcomes in terms of natural (without family-focused intervention) and therapeutic change in families exposed to multiple challenges and/or with at-risk or endangered children, particularly in what pertains to the satisfaction of the children's needs through parenting. Different sub-studies of our research project focus different factors. Some studies have a particular emphasis in exploring the family's own contributions for therapeutic change, by exploring the internal experiences of family members (e.g., thoughts, feelings, reactions to therapeutic support), in particular of parents, throughout assessment and intervention as well as the professional's personal and technical contributions. The project aims to explore what kind of changes of families undergo in face of adversity what are the factors associated with positive change and how it unfolds. This study is included in a set of studies aimed at exploring processes of change in families participating in a child protection integrative assessment/intervention under the scope of the Integrated Family Assessment and Intervention Model (Melo & Alarcão, 2011, 2013) in order to inform the development of resources for the assessment of the potential for family change in cases of children at risk or in danger.

The authors have many years of practice and research experience with families. They both train and supervise professionals in different settings and confront themselves with the difficulties presented by practitioners aiming to help families that deal with multiple challenges and face mandated assessments and interventions in child protection contexts. In designing and conducting their research, the authors have been inspired and guided by the needs of the practitioners working "in the real world," by their concerns, difficulties and insecurities in producing information that could affect the lives of families. They were motivated by their calls for support and the wish to be able to identify favourable conditions for change. The authors' motivation for the broader research study was to develop a strong theoretical framework capable of guiding case conceptualization and case planning. The motivation for this particular study was to do so with a special focus on the process and dynamics of change. Through direct practice as well as training and supervision of interdisciplinary teams working with multichallenged families in community and child protection contexts, the first author has extensive direct and indirect experience with the type of cases included in this case study. She has spent hundreds of hours analysing recordings or transcripts of sessions both in the context of the broader research project above mentioned and previous ones. This experience has created a sensibility for the themes and patterns associated with the families' organization in face of multiple challenges and child protection issues and their positions during assessment and intervention. She has also had the opportunity to analyse practitioner's skills and contributions as well as of broader factors impacting change.

In this paper, we report the results of a qualitative discovery-oriented multiple case-study, aiming to explore some basic dynamics underlying the families' transformations throughout the intervention provided during a child protection assessment. We aimed to investigate how different patterns and respective dynamics of change regarding the family's perceptions of internal family functioning and change, both within and outside the sessions, as well as their assessment of their involvement with the professionals and the session's utility, could relate to different types of outcomes. The concepts of Trajectories of States, Trajectories of States of Coordination and Influence Effects, are central to a content-independent coding scheme built for this study. They allow to systematically track variations in the family's quantitative reports, through time, in qualitative terms in order to explore patterns in how the families perceive themselves, change and the assessment/intervention in which they participated. The exploratory nature of this study relates to the aim to identify meaningful indicators that, assessed in simple ways, can provide the professionals with useful information regarding a family's potential for change and implications on how to manage intervention to match the family's potential.

Method

Procedure

The participants in this study were involved in an assessment for child protection purposes under the scope of Integrated Family Assessment and Intervention Model [IFAIM] (Melo & Alarcão, 2011, 2013). IFAIM is an integrative, family-centered, multisystemic, ecologic collaborative and strength-based approach to work with multichallenged families with at-risk, maltreated or neglected children. The model was developed as a collaborative approach to help families dealing with complex and multiple challenges change. Through an integrative eco-multisystemic approach, it aims to support family strengthening in face of adversity while addressing the risks or the conditions that threaten children's safety and development. It also aims to support the child protection and courts in the decision-making process by producing information regarding the family situation in face of change. Assessment and support for change are guided by an interdisciplinary team of professionals. These professionals share a common systemic and ecological theoretical framework and have specific training to conduct a collaborative assessment and intervention with families, privileging their natural contexts such as their homes and communities. The model shares some core values of other strength-based, solution-focused collaborative approaches (Berg, 1994; Madsen, 2007). It provides professionals with a framework to understand the emergence of the risks and forms of maltreatment and neglect to which children may be exposed but also to understand family organization, strength development and change in face of those challenges. It is an approach oriented to support the families beyond the elimination of immediate risks or danger for the child, aiming at the strengthening of family relationships and activation of family resilience processes. While the professionals keep a necessary focus on protecting the children and assessing conditions for their safety and positive development, they also keep their attention on the family and the factors, internal or external to it, or related to the coupling to its environment, that may facilitate parental and family change. The ecological and multi-systemic nature of the model is reflected in the fact that the team can conduct integrative interventions that attend to the relation between the different factors that either constrain or potentiate the family's change and positive adaptation in face of multiple challenges. Through an integrative support the team can help the family explore emergent synergies for change. For example, support at the level of the couple's relationship can be done in a close connection with the support provided for the improvement of parenting skills and both can be facilitated by work focused in improving the family's physical and social living conditions. Because the same team works with the family at multiple levels it may help the family optimize the conditions for change. The privilege of an in-home and community setting, as well as the interdisciplinary nature of the work are also facilitative factors for family involvement and tend to minimize the power imbalance between professionals and family members. Although this imbalance is clear, the team seeks to share the responsibility with the family about the information to be transmitted to the court or child protection services. The team clearly explains to the family the rationale for every proposed activity or assessment task and invites the parents to formulate their own opinions. The assessment is transparent as the team clearly shares with the family its concerns, in a non-judgmental and respectful way. It also has a strong focus on exploring and amplifying the family's strengths and opportunities for change while inviting the it to take responsibility for the decisions in that regard. The team produces assessment reports that are usually shared with the family prior to being sent to the court or child protection services. It invites the family to take a stance towards the assessment report and gives it the possibility of attaching its comments to the report. The team systematically calls for the family's opinions

about the work being developed and the relationship with it, discussing concerns, constraints and opportunities associated with it.

IFAIM was initially designed to be implemented in Portuguese Family Support and Parental Counselling Centres due to the special conditions that these centres presented to support families in an intensive and integrative way (Melo & Alarcão, 2011, 2013) Typically these centres have a team composed of at least three professionals, most often one psychologist, a social worker and a social educator. The teams that participated in this study had specific training to work under [model name] have specific training. For each case, two professionals are selected, according to the teams' preliminary case hypotheses at referral (considering the themes and processes of what could be core areas of assessment and intervention) and their work overload. The third element has, nevertheless, an important role in the case. She acts as a critical observer, assisting the core team in staying reflexive regarding factors that may constraint the relationship with the family, the work developed and its outcomes.

One of the special features of the assessment conducted under the model is its length (3-4 months) and the fact that it integrates family and parental intervention. Hence, when referring to assessment we hereafter refer also to the intervention component aiming to offer the family support for change. The intervention supports a clinical judgment regarding the probability that the family will benefit from the support available and the extent it will be able to perform, and sustain, the necessary changes to ensure the child's safety and well-being. The professionals elaborate hypotheses regarding the variables and processes implicated in problem maintenance and change that are shared with the family. They simultaneously test their hypotheses, through support focused on key areas of parental capacity, and the factors that are thought to constrain it, including family relationships. The work is developed collaboratively, in a very transparent way, respecting and validating the family's strengths, actively involving and offering it a space for informed and reflected decision making. The team tries to help the family develop an understanding of the consequences of non-change both for the family and the child and to explore possible alternatives to family functioning and family life. It invites the family to develop a reflexive empowered stance regarding its options and choices pertaining change. The sessions may occur in a variety of settings (team's office; family's home; special locations in the community or community settings relevant to the case such as schools or day care centres for network meetings) and involve different configurations of elements from the family. In the cases included in this study, most sessions involved both parents, although some sessions were performed individually, albeit simultaneously, with each parent and a different team member and are, therefore, numbered the same way. Some sessions may also involve the parents and the children. Additionally, some sessions may involve other individuals relevant to the case such as the child protection or court officers, children's teachers, extended family or other relevant members in the community.

Due to the implications of the assessment, the team uses a variety of techniques and procedures and combines several strategies and techniques (e.g., participative observation in natural settings; unstructured interview; structured interviews; use of formal assessment instruments as questionnaires), across several moments.

After the assessment, it reports to the referral services: (a) the strengths and vulnerabilities regarding parental capacity, family functioning, contextual and environmental conditions and their possible role in problem maintenance and change; (b) the changes performed during the assessment and the areas that continue to pose threat to the child; (c) the potential for the family change and the likelihood of the family performing and maintaining target changes concerning the child protection; (d) a tailored, integrated family support plan, when appropriate; (e) the family's willingness to maintain collaboration according to that plan. Assessment also aims to foster the family's motivation and willingness to change. Sometimes, core relational risks are eliminated during assessment but, most often, some risk factors remain

to be targeted by specific interventions (e.g., parental education) in a following stage. Assessment is considered successful when it was based on a collaborative partnership with the family and offered some level of intervention. The success of an assessment depends not on the family changing but on the professionals being able to produce the necessary information to inform decisions protecting and promoting the child's well-being and to report their perception regarding the likelihood of the family performing the necessary changes. At the end of the assessment, the teams fill a set of assessment instruments [blinded for review] to identify risk and protective factors. We do not present these data in this paper but they inform the final recommendations.

The collaborative nature of the model is often expressed in the family's assessment of the services provided. In the context of the current and previous studies the first author collected anecdotal reports of positive assessments of the team by the families, even in cases where the team's opinion was contrary to the family's position. This information was often reported informally by the child protection and court services or by the families during interviews with the first author in the context of other studies. The families often reported feeling respected and well informed by the teams, knowing clearly what their options, choices and consequences were about, even when they did not agree with the team's concerns. Although there is no systematic compilation of these reports they do provide some support for the collaborative nature of the approach and are congruent with research that favours collaborative approaches in cases of involuntary interventions (Sotero & Relvas, 2012).

Participants

The Teams

Three IFAIM teams from Parental Counselling and Family Support Centres received regular supervision from the first author in monthly face-to-face meetings and complementary videoconferences. All teams have previously participated in an extensive training program (18 to 24 months), followed by regular case supervision) to implement the [model name blinded for review]. The first author analysed most of the sessions' audio records or transcripts, as well as the teams' notes, providing feedback between meetings. The first author also supervised other cases not included in this study and has extensive direct and indirect experience with similar cases. The collaboration of the teams in the study is part of a broader research collaboration, in the context of which the teams participate in supervision with the first author.

The teams administrated the measures to the families in the beginning and end of the sessions.

The Families

Four families participated in this study, referred by the Courts (A and B) or Child Protections Services (C and D) due to child neglect. Some information was disguised and altered for confidentiality. Most often the families that are under the Court jurisdiction have either not consented to the child protection services intervention or have failed to comply with agreements with those services and are, therefore, referred to the Court. There may, therefore, be differences in terms of their readiness for change and the pressures they have experienced for that change.

Table 1 and 2 presents some information regarding the families' composition and ages of family members. The same table shows information regarding the number of sessions for each case, as well as the total number of sessions to which the family filled the measures. The

table shows, between brackets, the specific number of the session for which there is missing data.

Table 1. Information about the families A and B, number of valid responses in diaries per dimension, total sessions and missing data

Dimension	Family A		Family B	
	Mother, 30 y; Father, 47 y; Children, 5, 8, 10 ys		Mother, 34 y; Father, 39 y Children, 15, 11, 6, 3 ys	
	Number of valid responses in the dimension being measures per total number of sessions per case [Specific number of the sessions with missing data]			
	Mother	Father	Mother	Father
1. Family well-being	16/19 [2; 17; 19] ^{b)}	4/19 ^{a)} [1-13; 17-19]	19/26 [3; 20-22 ^{b)} ; 24-26 ^{b)}	19/26 [3; 20-22 ^{b)} ; 24-26 ^{b)}
2. Family strength	16/19 [2; 17; 19] ^{b)}	4/19 ^{a)} [1-13; 17-19]	19/26 [3; 20-22 ^{b)} ; 24-26 ^{b)}	19/26 [3; 20-22 ^{b)} ; 24-26 ^{b)}
3. Need for change	16/19 [2; 17; 19] ^{b)}	4/19 ^{a)} [1-13; 17-19]	11/26 [1-8; 16; 20-22 ^{b)} ; 24-26 ^{b)}	12/26 [1-8; 20-22 ^{b)} ; 24-26 ^{b)}
4. External pressure	16/19 [2; 17; 19] ^{b)}	4/19 ^{a)} [1-13; 17-19]	11/26 [1-8; 16; 20-22 ^{b)} ; 24-26 ^{b)}	12/26 [1-8; 20-22 ^{b)} ; 24-26 ^{b)}
5. Family changes outside the session	16/19 [2; 17; 19] ^{b)}	4/19 ^{a)} [1-13; 17-19]	18/26 [3; 16; 20-22 ^{b)} ; 24-26 ^{b)}	19/26 [3; 20-22 ^{b)} ; 24-26 ^{b)}
6. Family capacity	16/19 [2; 17; 19] ^{b)}	4/19 ^{a)} [1-13; 17-19]	19/26 [3; 20-22 ^{b)} ; 24-26 ^{b)}	19/26 [3; 20-22 ^{b)} ; 24-26 ^{b)}
7. Confidence in the family capacity to deal with problems	16/19 [2; 17; 19] ^{b)}	4/19 ^{a)} [1-13; 17-19]	16/26 [14-15; 17-26]	16/26 [17-27]
8. Individual or family changes inside the session	16/19 [2; 17; 19] ^{b)}	4/19 ^{a)} [1-13; 17-19]	18/26 [19; 20-22 ^{b)} ; 24-26 ^{b)}	18/26 [19; 20-22 ^{b)} ; 24-26 ^{b)}
9. Session utility	16/19 [2; 17; 19] ^{b)}	4/19 ^{a)} [1-13; 17-19]	19/26 [19; 20-22 ^{b)} ; 24-26 ^{b)}	19/26 [19; 20-22 ^{b)} ; 24-26 ^{b)}
10. Family involvement in the sessions	16/19 [2; 17; 19] ^{b)}	4/19 ^{a)} [1-13; 17-19]	19/26 [19; 20-22 ^{b)} ; 24-26 ^{b)}	19/26 [19; 20-22 ^{b)} ; 24-26 ^{b)}

^{a)} Father only attended four sessions after the first for which he did not fill diary. He refused to collaborate with team until the 14th session by mother's pressure

^{b)} Team's failure to deliver diary or loss of diary in the mailing process

Note: Failure to deliver diary was most often due to: high pressure period related to pressure to end assessment and report to court and he family showed little willingness to experiment change so sessions were focused on clarifying missing information and not change oriented (family B- sessions 20-22; 24-26); team forgot diaries and context was unfavourable (e.g., in-home session) or failed to deliver them in the session due to time constraints on session and lack of change focus of the session (family A and B).

Table 2. Information about the families C and D, number of valid responses in diaries per dimension, total sessions and missing data

	Family C		Family D	
Family composition and age in years	Mother, 29 y; Stepfather, 39 y Children, 11, 6, 3 y		Mother, 22 y; Father, 26 y Child, 9 months	
Dimension	Number of valid responses in diaries per total number of sessions per case [specific number of the sessions with missing data]			
	Mother	Father	Mother	Stepfather
1. Family well-being	15/23 [6, 9 ^b], 14, 19-23 ^b]	15/23 [6, 9 ^b], 14, 19-23 ^b]	13/15 [14-15] ^b)	13/1 [14-15] ^b)
2. Family strength	15/23 [6, 9 ^b], 14, 19-23 ^b]	13/23 [5, 6, 9 ^b], 14-15, 19-23 ^b]	13/15 [14-15] ^b)	13/15 [14-15] ^b)
3. Need for change	8/23 [1-7, 9 ^b]-10, 13, 19-23 ^b]	9/23 [1-7, 9 ^b]-10, 14, 19-23 ^b]	9/15 [1; 5-7; 14-15 ^b)	11/15 [1; 4; 14-15 ^b)
4. External pressure	8/23 [1-7; 9 ^b]-10; 14; 19-23 ^b]	9/23 [1-7; 9 ^b]; 14; 19-23 ^b]	11/15 [1; 4; 14-15 ^b)	9/15 [1-4; 14-15 ^b)
5. Family changes outside the session	15/23 [6; 9 ^b]; 14; 19-23 ^b]	15/23 [6; 9 ^b]; 14; 19-23 ^b]	11/15 [5-6; 14-15 ^b)	13/15 [14-15 ^b)
6. Family capacity	15/23 [6; 9 ^b]; 14; 19-23 ^b]	15/23 [6; 9 ^b]; 14; 19-23 ^b]	13/15 [14-15 ^b)	13/15 [14-15 ^b)
7. Confidence in the family capacity to deal with problems	15/23 [6; 9 ^b]; 14; 19-23 ^b]	11/23 [5-6; 8-9 ^b]; 13-14; 17; 19-23 ^b]	12/15 [1; 14-15 ^b)	12/15 [5; 14-15 ^b)
8. Individual or family changes inside the session	14/23 [6; 9 ^b]; 14-15; 19-23 ^b]	14/23 [6; 9 ^b]; 14-15; 19-23]	12/15 [5; 14-15 ^b)	12/15 [5; 14-15 ^b)
9. Session utility	15/23 [6; 9 ^b]; 14; 19-23 ^b]	11/23 [5-6; 8-9 ^b]; 13-14; 17; 19-23 ^b]	12/15 [1; 14-15 ^b)	13/15 [14-15 ^b)
10. Family involvement in the session	14/23 [6; 9 ^b]-10; 14; 19-23 ^b]	11/23 [5-6; 8-9 ^b]; 13-14; 17; 19-23 ^b]	12/15 [1; 14-15 ^b)	13/15 [14-15 ^b)

^b) Team's failure to deliver diary or loss of diary in the mailing process

Note: Failure to deliver diary was most often due to: high pressure period related to pressure to end assessment and report to court and he family showed little willingness to experiment change so sessions were focused on clarifying missing information and not change oriented (family C, 10-23; Family D, 14-15); high stress period of the team's relationship with the family due to emergent child protection concerns (e.g., family C, 19-23); team forgot diaries and context was unfavourable (e.g., in-home session) or failed to deliver them in the session due to time constraints on session and lack of change focus of the session (family C, 9).

We obtained written informed consent from all participants. Although there is no Institutional Review Board in Portugal, the study was approved by the Scientific Councils of the research institutions to which the authors are affiliated.

The teams explained to the families that the study aimed to understand how professionals could better help families by investigating what helped them to deal with the difficulties of their lives and to address the concerns of the child protection systems or courts. It was also explained that the researchers aimed to understand what the parents felt and thought during the sessions. The team also highlighted that the families would have an opportunity to assess the professionals' performance, which could help future cases. It was explained that the family could drop at any time from the study without that having any implications for their

case. The parents filled measures at the beginning and end of each session. In order to balance the power dynamics, the families were given a pre-sealed envelope that they could use to mail the data directly to the researcher. The team delivered the measures with an identification code to the family in order to ensure confidentiality and protect the family in case of loss of material in the mailing process. The families authorized the researcher to have access to the videos or audio-recordings of the sessions and to supervise the teams. They were instructed that, at any moment, they could meet the researcher if they wanted to and were given direct contacts. Families A and D also participated in interviews with the first author in the end of assessment. Interviews with family B were C were not realized. Family B was available but due to transportation and time constraints it was not possible to schedule interview. The team considered that family C was, at the end of the assessment experiencing strong emotions due to the removal of the children and living with a crisis that made the interview inadequate at that time. The families also authorized the researcher to have access to similar measures filled by the professionals, regarding their own experience in the session. While the family filled their diary measures in the sessions the professionals filled, at the same time, their corresponding version of the diaries. Each parent received a separate diary measure. They all sealed in an envelope their data. The professionals' data is not reported in the present study. The most frequent time interval between sessions was a week.

Measures

At the beginning and end of each session, each parent filled a paper-and-pencil “diary” measure containing two sections. The “diaries” were so called because they intended to capture the parents' experiences throughout the entire assessment (Laurenceau & Bolger, 2005). They were organized in two sections. The first section contained a set of closed questions rated in a 5-point Likert scale, ranging from 1 (“Nothing”) to 5 (“A lot”). The second section contained open-ended questions where the family was invited to share their internal experiences (e.g., feelings/emotions and thoughts) about a series of topics related to the family's life during the week or the session.

In the first session, the teams read each question of the diaries to the parents to ensure they understood the content of the questions and clarified doubts. The team explained they had equivalent diaries that they would fill at the same time as the family. In this paper, we only report data from the quantitative section of the diaries. The diaries had two versions. The “diaries of the week” inquired about changes and experiences during the period that mediated the sessions and was filled in the beginning of the session. The “diaries of the session” inquired about experiences and changes in the session, and where filled in the end. The selection of the dimensions, corresponding to a question to be included in the quantitative diaries was based on our previous exploration, of these and other cases, in search for relevant variables to understand change. Table 3 presents the 10 dimensions we have explored in this study and the corresponding questions in the closed question section of the diaries.

Table 3. Dimensions analysed and corresponding questions in diaries

Dimension	Corresponding question in diary
1. Family well-being	How do you assess your family's well-being- happiness, optimism, confidence-this week? (week diary)
2. Family strength	Please assess the level of strength that you think your family showed this week? (week diary)

3. Need for change	To what extent did you feel your family experienced a need to change something in its functioning or thought it was beneficial? (week diary)
4. External pressure	To what extent do you think your family felt being pressured, by other people, to change something in its functioning? (week diary)
5. Family changes outside the session	To what extent do you think your family made changes in its functioning during the week? (week diary)
6. Family capacity	To what extent do you think that, this week, your family was able to deal with the problems/difficulties that affect it? (week diary)
7. Confidence in the family capacity to deal with problems	To what extent did you feel the members of the family would be more capable of dealing with the problems/difficulties they face? (session diary)
8. Individual or family changes inside the session	To what extent did you feel that, different than usual, things happened between family members or in their individual behaviour? (session diary)
9. Session utility	To what extent do you think the session was useful? (session diary)
10. Family involvement in the session	To what extent did you feel your family was involved in the session? (session diary)

Working with mandated cases of child protection is often working with families and, in particular, parents, who have not asked to change, nor for the intervention. In such cases, it is crucial to understand the extent to which parents felt a need for the family to change, if and how their position changed during assessment and how much they experienced external pressure for change (Horwarth & Morrison, 2000). Sometimes the change is initiated by an internal motivation, but other times it is the external pressure that induces change. Professionals often report that once external pressure is removed some families show a relapse in change or a return to previous states, especially when no internal motivation was construed. Hence, it was important to understand how much the families felt the need to change and how much that motivation was internal or external (Horwarth & Morrison, 2000). This information would also provide a way of understanding how a shift from these positions (e.g., from external to internal motivation) could contribute to change (Snyder & Anderson, 2009). Since, from our previous experiences, some families claim to have changed or not changed despite considerations of otherwise from the child protection system, it was also important to understand how much their perception of changes inside and outside the sessions relates to successful outcome changes as assessed by the professionals, and how this varied through time. Sometimes the professionals consider outcomes that are related to the child protection but that have little correspondence to the parent's concerns or these are focused more on instrumental or material changes (e.g., improving housing conditions; changing basic care habits; finding a job) but not as much on relational and emotion-related changes (e.g., improving capacity to provide emotional support to children). Nevertheless, we hypothesized that experiencing change of some kind, from the

family's perspective, could be an important indicator to consider when assessing potential for change, since it could be a starting point to work towards more internal and relationally-driven motivations for change. It is crucial to understand if cases of success were associated with variations in the family's own perception of change, but also how both parents coordinate their positions and how much this can help understand the outcomes. The client is often the best predictor of change (Bohart, 2000). Since the parents' perception of the family's internal well-being (happiness, optimism, confidence) and perception of strength could influence change it was important to assess these dimensions. Knowing how much the parents perceived themselves as capable of dealing with difficulties somehow provides an indication of a powerful factor contributing to change (Miller & Rollnick, 2012). At the beginning of the assessment, many families state finding no reason to change due to considering to have a "good" family functioning or see "no problem" or difficulty. This impairs their motivation for change and should be investigated (Horwath & Morrison, 2000). It also seemed important to understand how much they felt capable of dealing with issues affecting their internal functioning (Miller & Rollnick, 2012). On the other hand, we wanted to understand if the sessions contributed to the parent's perception of being capable of dealing with difficulties or problems. Finally, it seemed relevant to assess how the parents perceived the sessions' utility and how involved they were (Fridlander, Escudero, & Heatherington, 2006; Snyder & Anderson, 2009).

The fact that the families were under a mandated assessment for child protection purposes may create a power imbalance in the relationships with the professionals. This may have interfered with the family's reports, albeit the team's caution in explaining the difference between the research purposes and their role regarding the assessment. Although the study is largely based on the family's reports, it is these same reports that teams in these contexts have to deal with and address. Therefore, understanding the family's reported experiences under these constraints is relevant to understand how to best help these families change. Our experience with previous cases and anecdotal reports collected over the years of supervision of teams such as those involved in this study, led us to believe that how the family perceives changes, independently of how much those changes are confirmed by the professionals, may be an important indicator for assessing the potential for change. We aimed to explore how these reports, and their relation to other dimensions could be related to different types of outcomes. We believe this is a relevant goal not just for our research but studies to follow. On the other hand, our experience also showed us that many families openly express their dissatisfaction with the services, when it is the case, and contest the child protection concerns, independently of the pressure experienced by the assessment context. We expect that, for many families, the particular context of power imbalance will not constrain their reports more than in other research conditions.

Development and Description of the Coding Scheme

We developed a novel coding scheme to capture dynamic information on the parent's self-reports on the diary measures across the sessions. The responses on the closed Likert-scale based question of the diary were converted into graphics composing a time series of the parents' ratings for each dimension. The x-axis represented the time dimension, corresponding to the number of the session and the y-axis representing the level of rating, on the 5 point Likert scale, as illustrated by the graphic in Figure 1. The first author inspected the graphics with the aim of identifying the kind of relevant information they could provide regarding the process of change. Assuming that the different dimensions under analysis could be relevant to understand family change she focused on exploring how the family's position, regarding the dimensions of interest, changed through time and how that could relate to the kind of change expected from

a child protection point of view. She looked at the graphics looking to explore all kinds of information that could be produced from them. It was assumed that each time point was more than an isolated assessment, with a particular meaning for a given session or week. It should be seen as part of a wider context of a series of transformations that could relate, in particular ways, to an emergent case outcome. Therefore, and assuming a dynamical systems' perspective we considered that each assessment point needed to be considered in relation to other assessments as part of a system that changes according to certain parameters. The comparison of two data collection points could reveal not just if there was change (fluctuation) or absence of change (stability) but also the direction of change. Additionally, it became clear that one could clearly distinguish the families by the overall shape of the graphics. The relation between the different codes or segments of data needed to be analysed considering the emergent pattern or shape of the process of change for that particular dimension. Therefore, we needed to code for the higher level of organization of that system which corresponded to a trajectory of change or a particular dimension. We hypothesized that the patterns of change in the dimensions we were analysing, which were mainly related to the therapeutic process, would relate in specific ways to the case outcomes relevant for child protection purposes. Assuming that the parent's change was as important as, at the family-level, the relationship between their positions, we explored the graphics for the coordination of the parents' reports throughout the study.

With these aims in mind, the first author inspected graphics with the parents' scores using an open coding procedure and constant comparison (Charmaz, 2006; Strauss, 1987) informed (Thornberg, 2012) by complexity science concepts (e.g., fluctuations, stability, bifurcations, enslavement, coordination, pattern, self-organization, attractor), particularly Coordination Dynamics (Fuchs & Jirsa, 2008; Kelso & Engström, 2006) and Dynamic Systems Theories (Thelen & Smith, 2006) We used these concepts as sensitizing tools to explore the data and raise new questions.

As the individual codes emerged they were integrated into categories and their properties were progressively refined. The coding scheme was developed, from the bottom-up and compiled in a coding manual containing the operational definitions of each code and coding rules. A list of codes and the coding manual are provided supplementary materials to this paper [blinded for review].

We only here briefly describe the core categories and codes as they were used to code the data, once the coding scheme was fully developed. For each family dimension, a Trajectory of states was defined. A trajectory corresponds to sequence of states representing the temporal evolution of a given dimension of family functioning. In this study, it is represented by graphical time series of data collection points. Each dimension has a set possible states corresponding, in this study, to levels (Low, Medium, High), and sub-levels (the specific ratings available within a level). We defined low levels for this state as those with ratings of 1 or 2 in the Likert scale, moderate levels to correspond to ratings of 3 and high levels to correspond to ratings of 4 and 5. Coordination emerged as a category conceptualized by the difference between the scores of family member 1 (the mother) and family member 2 (the father/stepfather). Graphics for trajectories of coordination were created with the values for the coordination between the parents' score for each dimension as illustrated by the graphic in Figure 2.

The evolution of the states of coordination through time composes a Trajectory of Coordination. We shortly describe the categories and properties, most of them equally applicable to the Trajectories of states and Trajectories of Coordination. Italics signal categories and properties and first capital letters identify a category. The overall trajectories are characterized by Patterns. Any Pattern variable is defined in terms of the Dominance of its properties, or Predominance, when one or more (mixed pattern) indicator of a property appears

at least above two times more than others (other criteria could be established). A predominant pattern can show Punctuations of other variations of the property. Trajectories show different Patterns of Level of Intensity.

The analysis of change, and the definition of the patterns depends, therefore on the elementary properties of Fluctuations and Stability, which may be characterized by their duration. Fluctuations are differences of state between two consecutive time points, of different sizes. The Fluctuations' may lead to an increase, decrease or level maintenance. Stability corresponds to the absence of change between two consecutive time points. A Pattern of Fluctuations or Stability results from the combination of level and duration.

Different combination of the properties of the Patterns of Stability and Fluctuations define different types of Trajectory of Change, representing the evolution of the process of change for a given dimension. When the trajectory of change concerns change itself, (in this study we analysed the parents' perception of changes in the family, inside and outside the sessions) it provides a sort of qualitative derivative of change, a measure of the pace of change through time.

Balanced Trajectories equilibrate fluctuations and stability and there is no predominance of each. They may be Simple (when there is one dominant or predominant form of stability or fluctuations) or Complex. The former can also be sequential (showing sequences of periods of more, or less, long periods of fluctuation and stability) or intermittent (intermittent alternation). When these trajectories end in long or very long periods they are coded as leading to stability or fluctuation.

Unbalanced trajectories may be fluctuant, stable, unstable or static. Fluctuant trajectories show predominance of fluctuations but punctuations of, moderate to long, or frequent, but short, periods of stability. Stable trajectories show predominance of stability over fluctuations but may have some punctuations of fluctuations, contrary to Static trajectories, where fluctuations are rare. Fluctuations are abundant in Unstable trajectories, which have only, if any, few isolated periods of stability.

Figures 1 and 2 illustrate the application of some codes to sample sections of the trajectories regarding the perception of change during the week and the coordination of those perceptions for one of the families in the study, respectively.

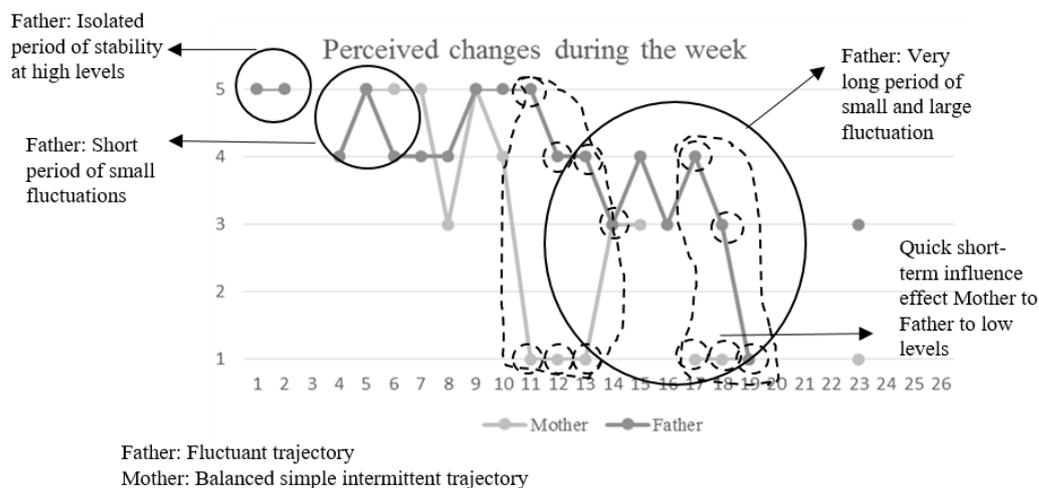


Figure 1. Example of codes applied to trajectory of perceived changes during the week

A state or level of coordination represents a collective family-level variable expressing the relative position between family members concerning a given dimension. Absolute synchronization corresponds to zero difference and Relative synchronization to small

differences (in this study, values of ± 1). Absolute unsynchronization corresponds to a state of maximum difference between family members while relative unsynchronization to states between relative synchronization and absolute unsynchronization (values of ± 2 or ± 3). Family trajectories may be characterized by Patterns of Coordination.

The Direction of coordination is either neutral, positive (scores of family member 1 are superior to family member 2) or negative (the opposite). The orientation of coordination may oscillate or maintain direction.

Patterns of coordination are also defined by fluctuations and stability. Fluctuations may be small, moderate or large. They vary in Duration and Direction (away from absolute synchronization, towards absolute synchronization or level maintenance). Level and duration also define stability.

Trajectories of Coordination result from the combination of the properties of Patterns of Fluctuation and Stability.

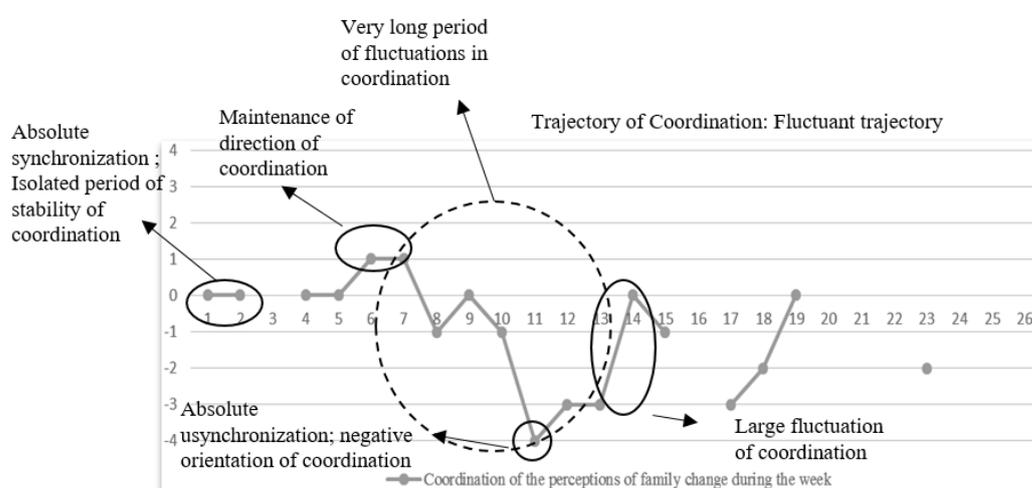


Figure 2. Examples of codes applied to trajectory of coordination of perceived changes during the week

We named Influence Effect (IF) a phenomenon appearing in the trajectories as a “dragging” effect, meaning that the position of one family member is “pulled” to meet that of the other. These Influence Effects were identified as potentially relevant change processes and probable mediators between of the individual and family levels of functioning. They are identified over a minimum of three consecutive time points (t_1 , t_2 , and t_3). The type of fluctuations in this interval defines different types of effects. Figure 3 illustrates the identification of different types of influence effects and their operational definition. Although we do analyse the effects by type in this paper the figure is provided as an illustration of the different pathways of influence that were considered.

Failed effects occur when patterns of fluctuation start to show a dragging effect but the apparent influence does not stabilize and dissolves before t_3 . Influence effects vary in rapidity (how long does it take for a member to be dragged to the other’s position) and duration (how long they last). The Direction of influence can be neutral (the positions of family members become closer but not equal) or from one family member to the other.

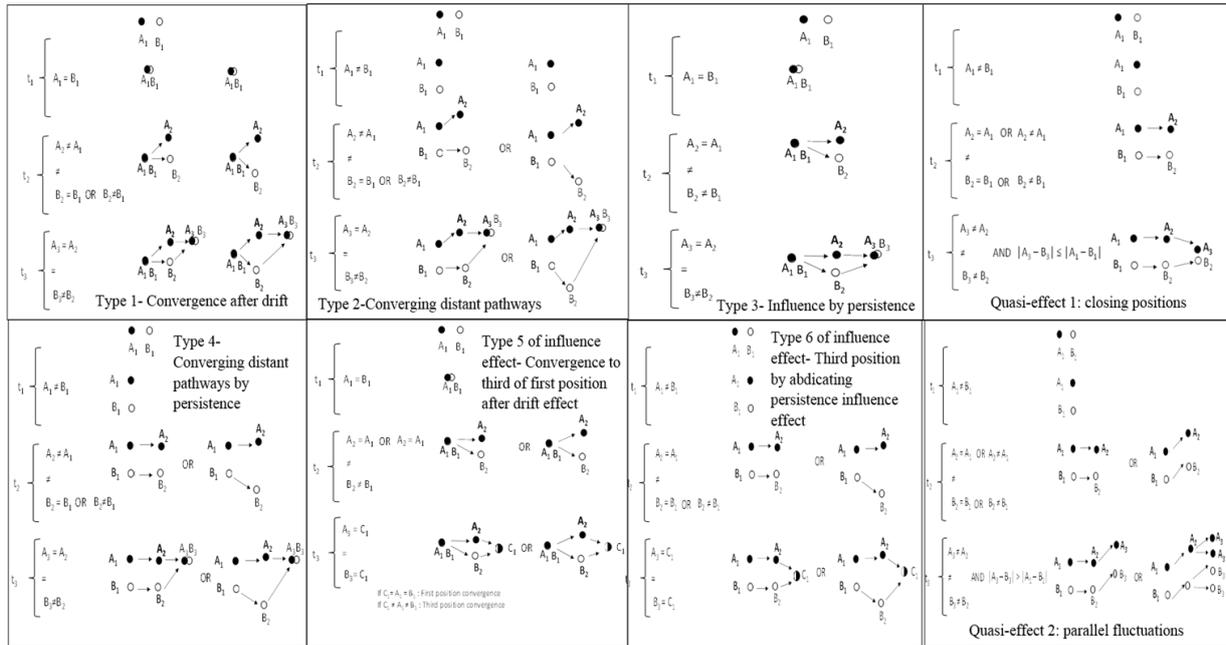


Figure 3. Illustration and operational definition of influence effects and quasi-influence effects

Data Analysis

After developing the coding scheme, we recoded all data, top-down, and all applicable codes were attached, sequentially, throughout every trajectory.

Figures 1 and 2 illustrate the attribution of some codes, for the purpose of illustrating the application of the coding process, using data collected from family B.

A pair of consecutive sessions was the minimal unit of analysis, allowing for the identification of change.

The coding is performed comparing a first score with the following one throughout the series to count to identify fluctuations and stability. Then, with the support of a word table, the coder registers the codes sequentially, as and computes the total count per code per trajectory. Following this, each fluctuations and stability periods (the portion of the trajectory during which fluctuations and stability can be identified before changing into one another) of the trajectory are coded for their defining characteristics (e.g., size, duration). Then, by analysing all applicable codes, the trajectory is coded in regard to the type of pattern of stability and fluctuations presented. By comparing the balance between the patterns of stability and fluctuation a type of trajectory is defined and all applicable codes are attributed.

Results

Detailed tables with the full coding outcomes for the four families can be found in Appendixes A to D. In the following sections, we present the highlights of the trajectories for each family as long as some specific information, for each case, regarding the concerns and relevant outcomes regarding child protection.

Family A

The parents evidenced some changes and the vulnerabilities that endangered the children disappeared by the end of the assessment. Nevertheless, the team feared the changes would regress without further intervention since the mothers' most vulnerable skills (concerning mostly emotional support and supervision) seemed easily affected by the couple's relationship. The couple had a history of conflicts and frequent ruptures. The family experienced economic hardship that often affected their daily life and routines. The team did not have the opportunity to help the couple reflect on how they could improve and stabilize their relationship due to the father's absence from the sessions. Towards the end of the assessment, the mother was able to involve him. They seemed to compromise to meet the children's best interest and to overcome the vulnerabilities in their relationship. By the end of the assessment, while there was no danger justifying a child protection intervention there were risk factors that deserved additional attention. The family expressed willingness to continue working with the team in voluntary terms. On these terms, the Court closed the case. Table 4 summarizes some salient features of the family's trajectories.

Table 4. *Highlights from the trajectories of change and coordination of Family A*

Trajectories of family functioning
<ul style="list-style-type: none"> • High levels of well-being, perception of capacity and confidence • High levels of session utility and involvement in the sessions • Need for change with mixed intensity • Predominance of low, with punctuations of high, external pressure • Predominance of low, with punctuations of high, changes outside the sessions • Changes within the session at mixed (high and low) levels
Trajectories of change
<ul style="list-style-type: none"> • Static and stable trajectories for most dimensions of positive family functioning • Balanced simple sequential for well-being • Balanced complex trajectory of need of change • Balanced simple intermittent for changes outside the sessions • Fluctuant for changes within the session • Change was abrupt (nonlinear)
Trajectories of coordination
<ul style="list-style-type: none"> • Orientation mostly neutral at absolute coordination levels • Mostly static
Influence effects
<ul style="list-style-type: none"> • Not enough data

Despite high levels of well-being, the family experienced peaks of external pressure and need to change. The sessions with the mother possibly induced these changes, which occurred abruptly (in peaks). The levels of absolute coordination signal the parents' reconciliation. However, since there was no therapeutic work with the couple, a relevant question was if that apparent equilibrium, opposite to the old one, was resilient enough. There

may not have been sufficient difference or variation to facilitate adaptation. The father's data is mostly missing so there is little information about his trajectory of change. One can assume that there is an abrupt change since he resumes participation and that there is an increased motivation for change but the information is scarce. It is possible that the couple had insufficient time to consolidate the coordination of changes in a way that integrates previous fluctuations. The team had doubts about the couple's capacity to negotiate agreements and feared that, at the level of their marital relationship, the mother was simply adjusting to the father's behaviour without mutual negotiation and coordination of changes. Follow-up information reveals that, after some months, the couple had another rupture and there were new concerns regarding the children's supervision.

Family B

Family B participated in the entire assessment and evaluated the team positively. However, the parents frequently expressed upset by the charges and the courts' deliberations, which they considered unfair and unsubstantiated. Core problems were associated with negligence regarding the children's supervision, basic health and hygiene care, physical safety, stimulation, emotional support, limit setting, among other issues.

The parents rejected all concerns despite continuing to attend the sessions, and disclosed finding "nothing new to learn." The team felt the father was more willing to reflect on their parental behaviours and family functioning, and on alternatives, but it was clear that the mother was not. The couple presented different views and investments regarding their relationship with each other and the children and their satisfaction with them. The father expressed discomfort but the mother rejected any possibility of changing their couple dynamics, which suited her needs. They were not willing to explore changes in their relationship so the assessment continued focused on parental competencies, which, nevertheless, seemed constrained by the couple's dynamics (e.g., father appeared to restrain from experimenting alternative practices in face of the mother's criticism). Since the parents expressed unwillingness to change, the team did not recommend any further intervention with them, but suggested alternative protection plans for the children. In the end, the father confessed finding some positive contributions in the conversations with the team and attempting some minor changes. The Court decided to keep the children with the family and close the case after some time, despite the team's report of little changes in parental capacity. Follow-up information revealed that one of the children had a severe accident at home with permanent incapacitating damage and had to be removed from home.

The parents' trajectories, summarized in table 5 show a stabilizing tendency.

Table 5. *Highlights from the trajectories of change and coordination of Family B*

Trajectories of family functioning
<ul style="list-style-type: none"> • <i>Both parents</i>: dominant or predominant high levels of intensity for most of the dimensions concerning positive family functioning; mixed levels of intensity for changes in the session including high levels • <i>Mother</i>: predominant low levels of need of change; mixed levels of change outside the session; • <i>Father</i>: mixed levels of intensity for most dimensions; predominance of high levels of change outside the session
Trajectories of change

-
- *Both parents:* mostly static or balanced simple intermittent trajectories for positive family functioning; balanced trajectory for changes in the session
 - *Mother:* Static trajectory for need of change; stable for changes outside the sessions
 - *Father:* unstable trajectory for external pressure; fluctuant for changes outside the session
-

Trajectories of coordination

- Frequent absolute synchronization, alternating with relative synchronization;
 - Relative unsynchronization for the need for change;
 - Trajectories of coordination mostly balanced but fluctuant for family change outside the session, and unstable for confidence and professional concern.
 - Inversed pattern of orientation of coordination (father perceived more changes during the week; mother perceived more changes in the session)
 - Coordination of changes within the session ended in fluctuations
-

Influence effects

- Sequences of interchanging influence effects with a stabilizing effect: latter effects reverse the former.
 - Sequences of influence effects for positive dimensions of family functioning mostly initiated with effects from the mother to the father, and ending with mother to father effect towards high levels.
 - Failed effects more frequent on the dimensions related to change. Father's influence effects prevalent for the dimension of changes within the session (towards high levels). Mother's influence effects prevalent for changes outside the sessions (towards lower levels).
 - Sequence of effects for changes outside the sessions starts with many failed effects, is followed by a father to mother influence towards moderate levels of change, and then by a mother to father influence towards low levels of change, ending with a failed effect.
 - Trajectories of change regarding changes in the session start with a quick mother to father effect towards high levels, and then a very slow father to mother influence towards high levels, but then ends with sequences of failed effects.
-

A return to habitual patterns follows fluctuations. Assessment was concluded with success probably because of the positive assessment of the team's performance, which may be explained by the collaborative nature of the approach [blinded for review]. But no significant change outcomes were identified by the team. There are mutual influence effects between the parents but they tend to nullify the fluctuations in dimensions pertaining change or to ensure the maintenance of dominant perceptions of high positive family functioning. While the fluctuant coordination trajectory for changes outside the session indicates perturbation in synchronization, it was probably not enough. The mothers' stronger negative influence, for changes outside the sessions, may have contributed to hinder significant change.

Family C

Family C was referred due to multiple risks and severe emotional neglect of the children. The mother escaped from a previous violent relationship to marry the children's stepfather. She took the youngest child with her but the two older children remained, for some months, with their abusive father. After reuniting, the mother experienced extreme difficulties in handling the children and showed great ambivalence towards them, either expressing her wish to care for them or rejecting them. She avoided physical contact and was, oftentimes, emotionally abusive. The youngest child showed signs of poor emotional regulation. She had a close relationship with the stepfather who opposed any disciplinary behaviours from the mother. The older children expressed rejection for the stepfather who seemed unable to understand their needs. He felt rejected while also excluding himself from daily family routines. The mother experienced great conflict between her own needs and the needs of the children, who she saw as a burden. She excused the stepfather's negative reactions and complied with his demands. The couple knew very little about each other, and spent little time alone. Negotiation and dialogue seemed difficult. The mother attempted to engage the stepfather in conversations regarding their relationship and family life but he threatened to leave her insisting that the children were the ones that needed to change. They faced severe economic hardship. The mother blamed the children for ruining her "possibility of having a new life." Both adults disclosed great suffering but they alternated between wanting to persist and abandon support.

The assessment lasted 24 sessions. In the end, the team agreed with the couple to continue intervention if they showed willingness to focus their relationship. During assessment, the mother improved many aspects of her relationship with the children. However, she seemed constrained by the couple's relationship (e.g., either restraining from limit setting or imposing excessively harsh discipline in attempts to avoid distressing the stepfather) and a negative image of herself. She was displeased but incapable of introducing changes, and the stepfather showed little motivation to any kind of change. Nevertheless, the family agreed to continue support. Soon after the end of the assessment, one of the children was severely injured by the stepfather's dog, subsequently blamed and emotionally maltreated. The mother failed to protect the children and they were removed from home. Follow-up information indicates that, by court order, the team resumed the work with the family to assess conditions for the children's return. The reunification happened months later, against the team's recommendations since there was little evidence of change in the areas constraining the mother's capacity for protecting the children, despite improvements in other parenting skills. The team continued to support the mother who eventually disclosed new episodes of abuse from the stepfather to the children (e.g., harsh rules; hiding food from the children; criticism). She was able to confront him and disclosed being prepared for a separation if he continues unavailable for change.

Follow-up information revealed that the case was kept open in the court but with no support for some time. The team was substituted by new members and some months later there is a new referral from the court for continuation of support. The mother and the stepfather agreed to work with a new team to improve parenting skills and overall family functioning. No information is available regarding the current status of the couple's relationship but there are no current indications of child maltreatment. It is possible that the mother's changes, however, facilitated changes at a broader family level, when novel external pressure was introduced.

Table 6 summarizes salient aspects of the family's trajectories.

Table 6. *Highlights from the analyses of the trajectories of change and coordination of Family C*

Trajectories of family dimensions
<ul style="list-style-type: none"> • <i>Both parents</i>: Most trajectories with mixed levels of intensity and predominant moderate levels with high and low punctuations; predominantly high with secondary levels for family involvement and perception of utility of sessions • <i>Mother</i>: positive family functioning at mixed or moderate with high punctuations • <i>Stepfather</i>: positive family functioning mostly at low levels
Trajectories of change
<ul style="list-style-type: none"> • <i>Both parents</i>: mostly fluctuant or unstable trajectories • <i>Mother</i>: balanced simple intermittent trajectories for positive family functioning • <i>Stepfather</i>: unstable trajectory for positive family functioning
Trajectories of coordination
<ul style="list-style-type: none"> • Mostly unstable trajectory with predominance of relative synchronization and instances of absolute synchronization and unsynchronization. • Opposite tendencies of parents for changes outside (neutral and negative orientation) and inside the session (negative and positive orientation). • Unstable trajectories of change and coordination for session utility and involvement
Influence effects
<ul style="list-style-type: none"> • Few influence effects • Mostly from the mother to the stepfather, towards moderate levels of well-being and capacity • Stepfather to mother influence towards low levels, for family strength and changes outside the session.

The trajectories reveal many instabilities, difficulties in the couple's coordination and few influence effects. The parents' perceptions of changes within the session oscillated in opposition, meaning that when one identified changes the other did not. The parents were changing at different paces and finding trouble in building common ground. The mother showed some relevant changes and reported, intermittently, some stable periods of positive family experiences, which may have supported her individual change.

Family D

Child protection concerns included poor housing conditions, financial hardship and lack of social support. Additionally, there was concern with the parents' psychological and practical preparation for parenting. Both parents grew, most of their lives, in foster care institutions. The team identified vulnerabilities in child care (e.g., irregular sleeping patterns, inadequate food, understimulation), parental individual functioning (e.g., emotional regulation) and the couple's relationship (difficulties in negotiation; verbal aggressions). The parents recognized some vulnerabilities but minimized their developmental impact on the child or the family's future. The team invited them to reflect on the constraints emerging from their relationship (e.g., the mother expressed loneliness and the father postponed job seeking). The

parents used some of the team's advice regarding the child's basic care but did not get involved in sufficient action to eliminate the risks nor to change their relational patterns. They expressed confidence that the child would not be removed from home. At times, the father seemed more willing to improve the family's life and more engaged in the sessions. Nevertheless, change efforts were erratic and the parents recurrently failed in implementing actions. The team proposed a support project conditional to changes in the family's motivation. Follow-up information indicates that the case was referred to the court and kept open for monitoring but no new deliberation. A new child was born in the meantime. The case was then referred again some months later with a request for assessment and support the family to assure essential conditions for child care and a new team was working with the family to improve parental skills, which seem to have stabilized. The couple's relationship continues to show vulnerabilities and instabilities but the couple is reticent to work at this level. Some risk factors are still identified but no danger for the child and the improvements regarding parental skills to be maintained. Table 7 summarizes core features of the family's trajectories.

Table 7. *Highlights from the analyses of the trajectories of change and coordination of Family D*

Trajectories of family dimensions	
<ul style="list-style-type: none"> ▪ Both parents: mostly moderate and high patterns of intensity of positive family functioning; predominantly moderate need for change; predominance of high utility in the sessions with moderate punctuations; high to moderate involvement ▪ Mother: moderate external pressure; moderate levels of change within and outside the session ▪ Father: mixed, high and low levels of pressure; predominance of high changes inside and outside the sessions with punctuations of changes at moderate level 	
Trajectories of change	
<ul style="list-style-type: none"> ▪ Both parents: stable trajectories of change of the need to change; unstable trajectories of change for external pressure ▪ Mother: mostly balanced simple intermittent trajectories; stable trajectory for sessions' utility but unstable regarding family involvement trajectories; stable trajectories for change within and outside the session ▪ Father: mostly balanced, complex fluctuant, and unstable; unstable trajectories for change within and outside the session; balanced trajectory for involvement 	
Trajectories of coordination	
<ul style="list-style-type: none"> ▪ Fluctuant trajectories for most dimensions, with predominance of relative synchronization and punctuations of absolute synchronization. ▪ Balanced trajectories for need for change and changes outside the session ▪ Fluctuant trajectory for external pressure and changes in the session ▪ Orientation of coordination reveals higher levels of intensity for most dimensions related to change reported by the father. 	
Influence effects	
<ul style="list-style-type: none"> ▪ Some influence effects but not effects for the dimensions related to change within or outside the sessions. ▪ Many failed effects 	

A moderate need to change and external pressure were probably insufficient to mobilize the parents for action. The father seemed more susceptible to the intervention but, despite the

fluctuations in his trajectories, he failed to influence the mother. The later introduction of more external pressure may have favour the continuation of the parent's involvement in change.

Discussion

The concept of Trajectory of States and Trajectories of Coordination applied to particular dimensions of family functioning, as the process variables analysed in this study, show promise in contributing to our understanding of how families change, through an exploration of both the dynamic and the coordinated nature of families as systems (Melo & Alarcão, 2014). Fluctuations and stability appear as core properties of change (Thelen & Smith, 2006) and their combinations reveals different trajectories of underlying processes that may contribute, differentially to the emergent outcome change at the family or parental level. When applied to reported perceptions of change these concepts provide a sort of measure of qualitative derivatives, signaling the pace of the unfolding change process.

Variations in the family members' perceptions of different dimensions of family functioning and change seem to constitute relevant indicators of the potential for change. Depending on the variables at stake, different combinations of stability and fluctuation may constitute positive or negative indicators.

A common-factors approach has highlighted the critical role of particular process variables to outcome change (Sprenkle, Davies, & Lebow, 2009). Nevertheless, there is still much to be known regarding the processes by which these variables contribute to the construction of therapeutic change. In particular, little is known about how the dynamic behaviour of these dimensions contributes to the final outcome and how they dynamically interact with each other. This study suggests that the shape of the trajectory of process dimensions may be of great relevance for change. It also suggests that it may be the interaction of the particular dynamics, between dimensions, that is critical to understand change. For example, the results hint that the experience of positive family functioning may be implicated in the overall change process depending on a) how much there is a concurrent need for change; b) how much the experience is coordinated with other family members. On the other hand, there is indication that without a high internal need for change, the experience of positive family functioning may deter change, particularly if external pressure is not experienced. There is also suggestion that increases of the perception of positive family functioning, when the initial starting point is low may be facilitative of change. When the initial levels are high, the opposite may be necessary as long as it is accompanied by a need to change or a perceived change that then leads to novel increases of positive family functioning.

Congruently with a systemic perspective, our study indicates that the individual's perception of change need to be, to some extent, synchronized with that of the other. The literature on therapeutic alliance has highlighted the importance of a shared sense of purpose for family change (Friedlander, Escudero, & Heatherington, 2006). This implies some degree of synchronized coordination. Nevertheless, for different thematic contents, states of relative synchronization may be necessary for family members to influence each other, hopefully in positive ways. A "difference that makes a difference" may be required for adaptation and viable change (Bateson, 1979). If the family changes too much, or too fast, their new organization may be hard to sustain. Periods of absolute synchronization may stabilize change. Nevertheless, our data suggest that trajectories of absolute synchronization may not be adaptive, if static. Not surprisingly, given the complex nature of a family system (Melo & Alarcão, 2014), the results reveal nonlinear changes.

Influence effects appear as essential processes underlying coordination, and mediators of the individual and collective levels of change. They seem to constitute a core coupling process that goes beyond simple feedback loops. Other studies highlighted the importance of

similar effects in couple's relationships (Gottman et al., 2005). In some of the cases parents failed to influence each other or established such a pattern of influence that fluctuations were dampened as the system returned to previous patterns.

This study suggests that different configurations of dynamic trajectories and trajectories of coordination can be associated with different outcomes. These complex interactions deserve more attention in future studies. Meanwhile, some hypothesis could be raised. Sensitized by the findings of this study we have attempted to engage in a type of exploratory and abducting reasoning, systematically exploring and hypothesizing how different configurations of properties of the trajectories would constitute positive or negative indicators of change. In appendix, we present two tables with the outcomes of our hypothesizes. The tables should be read horizontally as the combination of properties leads to a hypothesized potential for change. We hope this kind of reasoning supports professionals in assessing their cases and invites future research to test these and other configurations and offer orientations for practice.

Understanding how families and parents change in such difficult situations as for the families in our studies is of utmost importance to guide more effective interventions. Systemic thinking has long been a hallmark of family science and family interventions and there is little doubt today about the positive contributions of a systemic approach for a variety of problems. Complex systems such as families show patterns that are the emergent result of the nonlinear interaction of its elements and inherently dynamic. Hence, it is imperative to understand the dynamic processes implicated in the transformations of the family as a system and how changes in different elements are coordinated through time. It is relevant to understand how different process dimensions of change and their dynamic behaviour interact to build more or less positive relational patterns and conditions for the children's safety and well-being.

The research community has yet to explore and build a greater diversity of methodologies congruently fit with the nature of the systems being investigated. Many family studies rely on individual reports of family functioning (Cox & Payley, 2003). In this study, through the concepts of coordination (Kelso & Engstrøm, 2006) the individual reports were easily converted into family-level measures. We have developed a simple methodological device, in the form of a coding scheme for self-reported Likert based data, that creates information on how potentially relevant process-focused variables behave throughout an intervention. It also provides information about the nature of the relationship between members of the system, in regard to them. While different methods have been used that are inspired by complex dynamic systems methods (Guastello & Gregson, 2016; van Geer, 2012) we know of few that could such easily be translated and adapted for use into clinical practice with a clear clinical significance. By collecting information on process variables during intervention with families the professionals may be in a better position to elaborate hypotheses regarding what processes should be targeted for change and at what level (individual vs. collective level). The current method, by providing information on fluctuations as core elements of the construction of change can also inform the professional about the current level of family organization that is more susceptible to experience change. For example, in some families, the fluctuations may be greater at the individual level and change may be initiated and best supported at this level, and then extended or reconstructed at the collective level of coordination. On other cases, it is the coordination between elements may have greater relevance and it may be important to either promote fluctuations at this level in order to introduce opportunities for individual change or to work at the level of coordination, when it is a favourable direction to build and stabilize change. The professionals can use the coding scheme as a guide into the complexity of the family's pathways to change: by exploring the role of fluctuations and stability (e.g., knowing when to induce perturbation assist change stabilization), coordination (e.g., support construction or disruption of synchronization) and influence effects (e.g., look for how family members exert positive influence on each other). Different processes may have a differential

clinical relevance for different cases and at different stages of the therapeutic process. The coding procedure used in this study is relatively content-independent and could be used in different types of studies. Most common therapeutic outcome and process measures, if applied at different points in time, can be converted into graphs and then analysed dynamically with our coding scheme.

After the participation in this study some of the teams have adopted the use of the diaries as part of their regular procedures. They collected information from other cases for other ongoing studies with poorly literate families. Because of that they started to read and fill the diaries with them. The experience revealed to be so positive that they now fill them together for all the cases in the beginning and end of the sessions creating an opportunity to discuss with the family their stance and readiness for change and the sessions' contributions. By analysing how the family is positioned on different process dimensions implicated in the stance or readiness profile for change they teams can in a better position understand what variables should be attended to in order to optimize the family's potential for change and at what level. The families also gain awareness of their own patterns and how they relate to the possibility of change. Similar feedback procedures have been used with positive results (Anker, Duncan, & Sparks, 2009).

This study has several limitations, namely concerning the missing data and the reduced number of cases, the constraints of the measures and their application that should be addressed in the future. More in depth case studies and larger samples are welcomed, as well as studies in different therapeutic and natural settings.

Future research should explore how, how much, and when, during the intervention, periods of stability and fluctuations in different process dimensions contribute to therapeutic success. It should map different types of trajectories of change and coordination and investigate their robustness to perturbations in longitudinal studies. It is also important to explore in more depth the relevance of the influence effects, in relation to different degrees of synchronization, to different types of pathways of change and outcomes.

This study results in two relevant contributions. The first one is methodological with the development of a new coding scheme to capture the dynamics of change in any given variable of interest during family interventions that is easily applicable to use by practitioners in real world settings. The second one opens a new area for the investigation of family change processes by the inspection of the form of the process of change at a systemic level through the inspection of the dynamics of the coordination between individuals.

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APPENDIX A. Trajectories of change and coordination of Family A

Dimension	Pattern of level of intensity	Trajectory of change	Pattern of level of coordination	Pattern of orientation of coordination	Trajectory of coordination
Well-being	(D) High	Balanced simple sequential	(D) AS	(M) Neutral	Static
Strength	(D) High	Static	(D) AS	(M) Neutral	Static
Capacity	(P) High, (Pc) moderate	Stable	(D) AS	(M) Neutral	Static
Confidence	(D) High	Static	(D) AS	(M) Neutral	Static
Need to change	Mixed, (P) Low and High	Balanced complex	(D) AS	(M) Neutral	Static
External pressure	(P) Low, (Pc) High	-	Mixed AS with secondary levels	(F) with (P) Negative	Unstable
Changes	(P) Low, (Pc) High	Balanced simple intermittent	Mixed, AS with secondary levels	Mixed, (P) Neutral and Negative	Balanced simple
Changes in session	Mixed, (P) High and Low	Fluctuant	(D) AS	(M) neutral	Static
Session utility	(D) High	Static	(D) AS	(M) Neutral	Static
Family Involvement	(D) High	Static	(D) AS	(M) Neutral	Static

Note: The data from the father was insufficient to assess influence effects

Legend for the codification of trajectories and influence effects (applicable to APPENDICES 1 to 4):

D = Dominance of; P = Predominance of; PC = Punctuations of; F = Fluctuations; M= Maintenance; AS = Absolute synchronization; RS= Relative Synchronization; RU = Relative unsynchronization; AU = Absolute Unsynchronization; ST= Short Term; MT= Medium term; LT = Long term; VLT = Very long term; M= Mother; F = Father; S = Stepfather; sub = sublevel (state); ↗ = Direction of influence towards *Increased values*; ↘ = Direction of influence towards *Decreased values*

APPENDIX B. Trajectories of states and coordination of Family B

Dimension	Pattern of level of intensity		Trajectory of change	Pattern of level of coordination	Pattern of orientation of coordination	Trajectory of coordination
Well-being	M: (P) High, (Pc) moderate F: (P) High, (Pc) Low	M: Static F: Static		Mixed (D) AS and RS	Mixed, (P) Neutral and Negative	Balanced simple intermittent
	<i>Sequence of Influence Effects: Quick ST M → F High; Slow ST F → M High; Slow ST M → F High sub.</i>					
Strength	M: (P) High, (Pc) Low F: (D) High	M: Stable F: Balanced simple intermittent		Mixed, (P)AS, (Pc) RS	Mixed, (P) Neutral and Negative	Balanced simple intermittent
	<i>Sequence of Influence Effects: Quick ST M → F High; Quick ST F → M High; Slow ST M → F High sub.</i>					
Capacity	M: (D) High F: (P) High, (Pc) Moderate	M: Balanced simple sequential, ending in stability F: Balanced simple sequential, ending in stability		(P) AS, (Pc) RS	(P) Neutral, (Pc) Negative	Balanced simple sequential ending in stability
	<i>Sequence Influence Effects: Quick ST M → F High; Quick ST F → M High; Quick LT M → F High.</i>					
Confidence	M: (P) High, (Pc) Low F: (D) High	M: Balanced simple sequential, ending in fluctuations F: Balanced simple sequential, ending in stability		Mixed, (P) AS and RS	Oscillation	Unstable
	<i>Sequence of Influence Effects: Slow ST M → F High; Quick ST F → M High; Quick ST M → F High; Slow 3rd position LT F → M High sub</i>					
Need to change	M: (P) Low, (Pc) High F: Mixed, (P) Moderate and High	M: Static F: Static		Mixed, RS and RU	(F) with (P) Neutral	Balanced simple sequential
	<i>Sequence of Influence Effects: Failed effect</i>					
External pressure	M: (P) Low, with secondary F: Mixed, (P) Low and High	M: Static F: Unstable		-	-	-
	<i>Sequence of Influence Effects: Insufficient data</i>					
Changes	M: Mixed F: (P) High with secondary levels	M: Balanced simple intermittent F: Fluctuant		Mixed, (P) AS and RS	Mixed, (P) Neutral and Negative	Fluctuant
	<i>Sequence of Influence Effects: Failed effect; Failed effect; Slow 3rd position ST F → M Moderate; Quick ST M → F Low; failed effect.</i>					
Changes in session	M: Mixed, (P) High, Low F: Mixed, High and Moderate	M: Balanced simple sequential, ending in fluctuations F: Balanced complex		Mixed, (P) RS	(F) with (P) Positive	Balanced simple sequence ending in fluctuations
	<i>Sequence of Influence Effects: Quick ST M → F High; Very Slow ST F → M High; failed effect; failed effect</i>					
Session utility	M: (D) High F: (P) High, (Pc) Moderate	M: Balanced simple intermittent F: Balanced simple intermittent		Mixed, (D) AS and RS	Mixed, (P) Neutral	Balanced simple intermittent
	<i>Sequence of Influence Effects: Quick ST, F → M High; Quick ST M → F High sub; Quick ST F → M High sub; Quick LT M → F High sub.</i>					
Family Involvement	M: (P) High, (Pc) Moderate F: (D) High	M: Balanced simple sequential leading to fluctuations F: Static		Mixed, (D) AS and RS	Mixed (P) Neutral and Negative	Balanced simple sequential leading to fluctuations
	<i>Sequence of Influence Effects: Slow ST F → M High; Slow ST F → M High; Quick ST F → M High</i>					

APPENDIX C. Trajectories of change and coordination of Family C

Dimension	Pattern of level of intensity	Trajectory of change	Pattern of level of coordination	Pattern of orientation of coordination	Trajectory of coordination
Well-being	M: Mixed S: Mixed	M: Balanced simple intermittent S: Balanced simple intermittent	Mixed, AS and RS	Mixed, (P) Neutral and Positive	Fluctuant
<i>Sequence Influence Effects: Quick ST M → S Moderate; Quick ST M → S Moderate levels.</i>					
Strength	M: (P) Moderate, (Pc) High S: (P) Low (Pc) Moderate	M: Balanced simple intermittent S: Unstable	Mixed	Mixed, (P) Neutral and Positive	Fluctuant
<i>Sequence Influence Effects: Quick ST S → M Low</i>					
Capacity	M: (P) Moderate, (Pc) High S: Mixed, (P) Low and Moderate	M: Balanced simple intermittent S: Fluctuant	Mixed	(F) with (P) Positive	Unstable
<i>Sequence Influence Effects: Quick ST M → S Moderate; Quick ST M → S Moderate; Failed effect; Failed effect</i>					
Confidence	M: Mixed, (P) Moderate and High S: (P) Moderate with secondary levels	M: Balanced simple intermittent S: Unstable	Mixed, (P) RS and RU	(F) with (P) Positive	Unstable
<i>Sequence Influence Effects: No effects</i>					
Need to change	M: Mixed S: Mixed	M: Unstable S: Unstable	(P) RS	(F) with (P) Positive	Unstable
<i>Sequence Influence Effects: No effects</i>					
External pressure	M: Mixed, (D) moderate and Low S: (P) Moderate with secondary levels	M: Unstable S: Fluctuant	(P) RS, (Pc) AS	Oscillation	Unstable
<i>Sequence Influence Effects: Quick ST M → S Low</i>					
Changes	M: (P) Moderate and Low S: (P) Moderate with secondary levels	M: Unstable S: Fluctuant	(P) AS, with secondary levels	Mixed, (P) Neutral and Negative	Unstable
<i>Sequence Influence Effects Quick ST M → S High sub; Quick ST S → M Low sub.</i>					
Changes in session	M: Mixed, (P) Moderate and Low S: Mixed, (P) Moderate and high	M: Unstable S: Unstable	(P) RS, with secondary levels	Mixed, (P) Negative and Positive	Unstable
<i>Sequence Influence Effects: No effects</i>					
Session utility	M: (P) High with secondary levels F: (P) High with secondary levels	M: Fluctuant S: Unstable	(P) RS with secondary levels	Mixed, (P) Positive and Neutral	Unstable
<i>Sequence Influence Effects: No effects</i>					
Family Involvement	M: (P) High with secondary levels F: Mixed (P) Moderate and High	M: Unstable S: Unstable	(P) AS, (Pc) RS	(P) Neutral, (Pc) Positive	Unstable
<i>Sequence Influence Effects: Quick St M → S high sub-level</i>					

APPENDIX D. Trajectories of coordination of Family D for the five categories and twelve dimensions of family functioning

Dimension	Pattern of level of intensity	Trajectory of change	Pattern of level of coordination	Pattern of orientation of coordination	Trajectory of coordination
Well-being	M: (P) Moderate, (Pc) High (P) High with secondary	M: Balanced simple intermittent F: Balanced simple intermittent	Mixed, (D) AS and RS	(P) Neutral, (Pc) Negative and Positive	Balanced simple intermittent
<i>Sequence Influence Effects: Quick MT M → F High level; Quick ST F → M Low; Failed effect</i>					
Strength	F: (P) High with secondary levels M: Mixed, (D) High and moderate	M: Balanced simple intermittent F: Balanced complex	(P) AS, (Pc) RS	(P) Neutral, (Pc) Positive and Negative	Balanced simple intermittent
<i>Sequence Influence Effects: Quick MT M → F High sub; Quick ST M → F Moderate</i>					
Capacity	M: (P) Moderate, (Pc) High F: (P) High levels, (Pc) Moderate	M: Stable F: Fluctuant	(P) RS, (Pc) AS	(F) with (P) Negative	Fluctuant
<i>Sequence Influence Effects: Quasi-effect ST; Quasi effect MT; Quick ST M → F Moderate; Quick ST M → F Moderate</i>					
Confidence	M: Mixed, (P) High and Moderate F: (P) High levels (Pc) Moderate	M: Stable F: Unstable	Mixed, (P) AS and RS	Mixed, (P) Neutral and Negative	Fluctuant
<i>Sequence Influence Effects: Quick ST M → F, High sub; Quick ST F → M, Moderate</i>					
Need to change	M: (P) Moderate with secondary levels F: (P) Moderate with secondary levels	M: Stable F: Stable	Mixed, (D) AS and RS	(P) Neutral, (Pc) Negative	Balanced simple intermittent
<i>Sequence Influence Effects: Quick MT F → M Moderate</i>					
External pressure	M: (P) Moderate with secondary levels F: Mixed, (P) High and Low	M: Unstable F: Unstable	(P) AS, (Pc) RS	(P) Neutral, (Pc) Negative	Fluctuant
<i>Sequence Influence Effects: Quick 3rd position Low sub; Quasi-effect</i>					
Changes	M: (P) Moderate with secondary levels F: (P) High, (Pc) Moderate	M: Stable F: Unstable	(P) RS, (Pc) AS	(P) Negative, (Pc) Neutral	Balanced simple intermittent
<i>Sequence Influence Effects: Failed effect</i>					
Changes in session	M: (P) Moderate F: (P) High, (Pc) Moderate	M: Stable F: Unstable	(P) RS, (Pc) AS	(P) Negative, (Pc) Neutral	Fluctuant
<i>Sequence Influence Effects: Quasi-effect</i>					
Session utility	M: (P) High, (Pc) Moderate F: (P) High, (Pc) Moderate	M: Stable F: Balanced simple intermittent	(P) RS, (Pc) AS	(P) Negative, (Pc) Neutral	Stable
<i>Sequence Influence Effects: Quasi-effect</i>					
Family Involvement	M: Mixed, (P) High and Moderate F: (P) High with secondary level	M: Unstable F: Balanced simple intermittent	(P) RS, (Pc) AS	(P) Negative, (Pc) Neutral	Balanced simple intermittent
<i>Sequence Influence Effects: Quasi-effect</i>					

APPENDIX E. Hypotheses of predictions of potential for change from configurations of features of the family's trajectories for cases with high to moderate patterns of positive family functioning

Configurations of interactions between dimensions

Dimension and properties of trajectory	Patterns of states	Pattern Dynamics	Pattern of States of Coordination	Coordination Pattern Dynamics	Dimension and properties of trajectory	Patterns of states	Pattern Dynamics	Pattern of States of Coordination	Coordination Pattern Dynamics	Probable Indicator of Potential for Positive Outcome Change
Positive family functioning	Moderate-High	Static-Stable	Absolute synchronization/ Relative Synchronization or Mixed pattern with relative synchronizatio ^{a)}	Static-Stable or Balanced-Fluctuant ^{a)}	Levers for change /Perceived changes	High-Mod	Bal-Flu or St-Sb	AS-RS	Bal-Flu or St-Sb	Positive
						Mod-Mix	Bal-Flu or Flu-Un	AS-RS or RS-Mix	Bal-Flu or Flu-Un	Ambiguous and/or low resilience of outcome ¹⁾
						Mod-Mix	Flu-Un	RS-Mix or RS-Un	Bal-Flu or Flu-Un	Ambiguous for individual change ^{b)} ₂₎
						Mod-Mix	Bal-Flu or Flu-Un	RS-Mix or RS-Un	Bal-Flu or Flu-Un	Negative ^{c)} ₃₎
						Mod-Mix	St-Sb.	RS-Mix or RS-Un	Bal-Flu	Negative for individual change ^{b)}
						Mod-Low	St-Sb or Bal-Flu	AS-RS or RS	Bal-Flu or St-Sn	Negative for individual change ^{b)} ₄₎

Notes; Mod: Moderate; Mix: Mixed; AS: Absolute Synchronization; RS: Relative Synchronization; UN: Unsynchronization; St: Static; Sb: Stable; Bal: Balanced; Flu: Fluctuant; Un: Unstable

^{a)} R-Mix and Bal-Flu conditions apply, most likely, when there are Influence Effects leading to High-Moderate Values

^{b)} The individual in consideration is the one with the pattern of states corresponding to the ones presented, since they may be different for the other element, under some coordination conditions

^{c)} Indicators are probably negative when there are either No or Few Influence effects (raising Levers of Change/Perceived changes) or when there are mutual Influence Effects in sequences that neutralize each other, or directional influencing effects towards Low levels of Levers of Change/Perceived changes

¹⁾ Family A; ²⁾ Family B: Father; ³⁾ Family B; ⁴⁾ Family B: Mother

APPENDIX F. *Hypotheses of predictions of potential for change from configurations of features of the family's trajectories for cases with high to moderate to mixed or low patterns of positive family functioning*

Configurations of interactions between dimensions

Dimension and properties of trajectory	Patterns of states	Pattern Dynamics	Pattern of States of Coordination	Coordination Pattern Dynamics	Dimension and properties of trajectory e	Patterns of states	Pattern Dynamics	Pattern of States of Coordination	Coordination Pattern Dynamics	Probable Indicator of Potential for Positive Outcome Change
Positive family functioning	Mod-Mix	Bal-Flu or Flu-Un	AR-RS or RS-Mix	St-Sb or Bal-Flu	Levers for change /Perceived changes	High-Mod	St-Sb. or Bal-Flu	AR-RS or RS-Mix	St-Sb or Bal-Flu	Positive
						Mod-Mix	Bal-Flu or Flu-Un	AR-RS or RS-Mix	St-Sb or Bal-Flu	Ambiguous
	Mod-Mix	Many, some in opposition	Not RS-UN	Bal-Flu		Any, or many in opposition	Many, some in opposition	Not RS-UN	Balanced Fluctuant	Ambiguous to negative ^{a), 1)}
	Any with some in opposition ^{a)}	Bal-Flu and/or Flu-Un	RS-Mix or/and RS-UN	Bal-Flu or/and Fl-Un		Mod-Mix or Mod-Low	Bal-Flu or Flu-Un	RS-Mix or RS-Un	Fl-Un	Negative ^{b), 2) c)}
	Lot to moderate	St-Sb. or Bal-Flu or Bal-Flu	AR-RS or RS-Mix	St-Sb or Bal-Flu		Low-Mod or Mod-Mix	St-Sb. or Bal-Flu	AR-RS or RS-Mix	St-Sb or Bal-Flu	Negative or Ambiguous ^{d)}
	Low-Mod	Bal-Flu or Flu-Un	RS-Mix or RS-UN	Bal-Flu or Flu-Un		Low-Mod	Bal-Flu or Flu-Un	RS-Mix or RS-UN	Bal-Flu or Flu-Un	Negative

Notes. Positive Family Functioning; LC: Levers for change; PC: Perceived changes; Mod: Moderate; Mix: Mixed; AS: Absolute Synchronization; RS: Relative Synchronization; UN: Unsynchronization; St: Static; Sb: Stable; Bal: Balanced; Flu: Fluctuant; Un: Unstable

^{a)} In the absence of Influence Effects, in particular leading to an increase in most or all dimensions, change may be harder to achieve. When Influence Effects favour increases in the levels of the dimensions, the potential may be less negative.

^{b)} Either with few Influence effects, failed effects or directional influence effects towards Moderate or Low Levels of Positive Family Functioning and/or other dimensions

^{c)} UN and Low Positive Family Functioning may increase the risk for child maltreatment/neglect

^{d)} The potential is, likely, ambiguous when Pattern States are not at Low Levels, and more negative when the different dimensions are all at the same levels.

¹⁾ Family A; ²⁾ Family C

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