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Time-out placements in residential care: Towards a better understanding of restrictive measures in response to the behavioral manifestations of vulnerable youths

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ABSTRACT

Background: Youth in care are significantly more likely to exhibit intense behavioral manifestations (behavior that puts the youth or those around him at risk, or challenges the therapeutic relationship) than are youth in the general population and the majority have a history of multiple traumas. When youth behavior escalate, efforts are made to mitigate these behaviors. In Quebec (Canada), one such strategy is time-out placement (TOP). TOP is a short-term placement whose main objective is to temporarily separate a youth manifesting severe behaviors from the environment in which these behaviors occur. However, literature on trauma-informed practice suggests that TOP may present an increased risk of placement instability.
Objective: Our study aims to analyze differences between youth who have experienced this measure and those who have not in their placement trajectory, in the restrictive measures employed and in their behavior.
Participants and setting: The population (N = 3755) consisted of all youth (12–17 years old) having experienced residential care placement one day or longer, between the years 2014 and 2019, in Montreal.
Method: To control the potential effect of trajectory in childhood, a propensity score matching method was used to analyze the data extracted and create two groups based on the presence or absence of TOP in adolescence, then compared using hierarchical logistic regression.
Results: The results show that youth who have been subjected to at least one TOP in adolescence are more likely to exhibit behaviors of such intensity as to prompt the use of restrictive measures, and that the use of TOPs in the context of runaways may be commonplace. Indeed, TOPs are also associated with greater placement instability.
Conclusion: Our study supports recommendations to reform the intervention paradigm of child welfare services and institutions, rethinking current approaches to meeting the needs of youths in care to ensure that care becomes more trauma-sensitive.

1. Introduction

Youth in care are generally more likely to exhibit intense behavioral manifestations[1] than are youth in the general population (Gabrielli et al., 2015; Sawyer et al., 2007), and they are even more so when in residential care. Youths' behavioral manifestations can pose dangers to themselves and others, in some instances their underlying aim is to test the engagement of the people responsible for their care (Leloux-Opmeer et al., 2016; Smyth & Eaton-Erickson, 2009).

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[1] Intense behavioral manifestations refer to any behavior which, by its intensity, puts the youth or those around him at risk, or challenges the therapeutic relationship. The choice not to qualify behavior as problematic is a conscious one, in line with a trauma-sensitive understanding.

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1.1. Behavioral challenges and vulnerable youths in youth protection services

In a recent systematic review, Lee and Holmes (2021) report that youth in out-of-home care exhibit higher occurrences of internalizing and externalizing problems, depressive symptoms, and suicidal behaviors than do youth of the general population. They are also more likely to experience substance use problems, psychopathologies, and developmental delays. In addition, they are at risk of running away from care. In Québec, approximately a quarter of youth placed in residential care will run away at least once, while 12% will do so 10 times or more (Institut national d'excellence en santé et en services sociaux (INESSS) [National Institute of Excellence in Health and Social Services, Québec], 2017). Runaway episodes from residential care can be accompanied by significant risk taking that may push youth towards abuse and physical assaults (as victims or perpetrators), as well as possible sexual exploitation (Couture et al., 2021).

The majority of youth placed in residential care have a history of multiple traumas (Collin-Vézina et al., 2011, 2020; Zelechoski et al., 2013), which limit their ability to adapt to diverse perceived threats in their environment. These traumas are linked to difficult family situations that have led to severe to extreme abuse and neglect of various kinds. For example, Collin-Vézina et al. (2011) showed that among adolescents placed in residential care, abuse could be physical (34%), psychological (32%) or sexual (23%), and neglect could be physical (36%) or psychological (17%). Situations of extreme vulnerability may cause youths to place themselves in situations that are likely to engender new traumas. This is significant, because increases in traumas have been linked to increases in behavioral manifestations, including problems at school, attachment difficulties, substance use, running away, self-harm, suicide attempts, and delinquency (Briggs et al., 2012; Kisiel et al., 2009). Since the post-traumatic responses of youths can generate intense reactions, such as anger and running away (Collin-Vézina et al., 2020; Kisiel et al., 2009), working with them can present a particularly difficult challenge (Smyth & Erickson, 2009) and may bring about rejection on the part of people caring for them (Rock et al., 2015). Severe difficulties experienced by care workers in their interactions with youth exhibiting intense behavioral manifestations sometimes lead to the youths' placement move to a different care placement unit (Hartnett et al., 1999).

1.2. Restrictive measures and time-out placements in residential care

When youths' behavior intensifies, efforts are deployed to mitigate the escalating aggravation of those behaviors and to reestablish the alliance with their care worker. Measures restricting freedom in child protection system are used in several countries, sometimes with different names but all referring to forms of seclusion (or confinement) and restraint (Enell et al., 2022; Roy et al., 2019). Following a qualitative study involving interviews with youth and youth protection workers in the Netherlands, Van Dorp et al. (2021) proposed a definition of seclusion as follows: 'An involuntary placement in a room or area the client is not able or allowed to leave'. This study provided a better definition of a type of measure that is sometimes reduced to situations where the door is locked. However, isolation more broadly includes situations where the youth is not allowed to leave.

Restrictive measures are an umbrella term that covers a range of measures of confinement that restrict the physical and occupational freedoms of youth, employed in residential care facilities within the scope of managing youth behaviors. Comparing restrictive measures from one country to another is not always easy, given the different terms and legal restrictions that apply. For example, Enell et al. (2022) attempted to compare the different containment measures in Scandinavian countries. The majority of restrictive measures (e.g. solitary confinement, special care) are presented with a gradation and are likely to be used in contexts of intense behavioral manifestations. While Denmark and Sweden have secure facilities, Finland and Norway tend to use restrictive measures when necessary.

In Québec (Canada), one of the strategies employed in situations of intense behavioral manifestations is the time-out placement (TOP). The TOP intervention strategy consists of a short-term placement (generally between 1 and 30 days) with the main objective of temporarily separating a youth exhibiting intense behaviors from the environment in which their behaviors are occurring, while avoiding a change of placement to a more restrictive care unit. The time-out technique seeks to reduce the intensity of behavior through the removal of stimuli that reinforce those behaviors in the care environment (Smith, 1981). Thus, the specific aims of TOP interventions are to: a) temporarily remove the youth from an environment triggering or reinforcing their acts; b) alleviate the youth's emotional stress; and c) allow the youth to continue their trajectory within the same care unit (Centre jeunesse de Montréal – Institut universitaire (CJM-IU) [Montreal Youth Centre – University Institute], 2005). Bergeron (2006) states that this type of intervention aims to defuse the escalation that leads to acting out by destabilizing the youth in order to stimulate reflection. Isolating the youth through the use of TOPs has the purpose of developing their self-control and problem-resolution capacities (i.e., reflection, verbalization) (Bergeron, 2006; Day, 2002).

TOPs are part of a range of restrictive measures that differ according to three dimensions: duration, level of restriction of liberty and purpose (see Appendix A for characteristics of such restrictive measures). First, while some of these measures are immediate and brief (search/seizure, restraint), others may last up to several hours (seclusion, suspension from services) or several days and longer (TOPs, residential care secure units). Second, within this range of measures, some are especially restrictive and require the use of physical force (restraint) or door locking (seclusion, residential care secure units) (Association des centers jeunesse du Québec (ACJQ) [Québec Youth Centers Association des centres jeunesse du Québec, 2012; CJM-IU, 2018; Ministère de la Santé et des services sociaux, 2015). Third, if certain measures aim to respond to imminent danger to the youth or others (restraint, seclusion, residential care secure units) or removed dangerous objects (Search/seizure), TOPs and suspension from services constitute disciplinary measure that aims to respond to behaviors significantly divergent from established rules or code of conduct of care unit. What is specific about TOPs is that it involves removing a youth from their residential care unit for a period of multiple days, into an environment that does not require door locking. TOPs can therefore be considered as short-term placement. According to a study by Van Dorp et al. (2021), youth perceive the time-out room as the most invasive place before the seclusion room. However, they are not regulated and their use is characterized by the absence of explicit procedures and the discretionary nature of decisions made by the case worker (Lemonde & Desrosiers, 2000).

1.3. The use of restrictive measures in managing behavioral manifestations

While TOPs are meant to avoid more restrictive measures to manage youth intense behaviors, trauma-informed researchers (Day, 2002; Matte-Landry & Collin-Vézina, 2020) have described this type of placement move as a form of seclusion, since the youth is isolated from their regular environment and daily activities. However, the use of any restrictive measures (including TOPs) constitutes a controversial type of intervention, in particular because evidence for the efficacy of measures such as seclusion and restraint points mostly to temporary or short-term effects (Day, 2002; Enell et al., 2022; Roy et al., 2019; Van Dorp et al., 2021). Indeed, youths may perceive interventions aimed at behavior correction as a threat, potentially awakening traumas associated with negligence and abandonment, engendering further behavioral manifestations (Collin-Vézina et al., 2020; Matte-Landry & Collin-Vézina, 2021). Moreover, a majority of children perceive the experience of placement move (independent of duration) as rejection or abandonment

(Barber et al., 2004; D'Andrade, 2005; Hébert et al., 2016) and youths' perceptions of TOPs are not an exception to this rule (Bergeron, 2006). As well, the placement instability associated with moving between care environments can elicit anger, frustration, insecurity, and feelings of being misunderstood (Hébert et al., 2016), emotions likely to elicit subsequent behavioral reactions.

Overall, the literature demonstrates that placement moves are predictors of the emergence and persistence of intense behavioral manifestations (Aarons et al., 2010; Hébert & Lanctôt, 2016; Newton et al., 2000; Rubin et al., 2007). Behavioral manifestations, in turn, are likely to be met by further restrictive measures. Indeed, a significant proportion of the literature establishes a bidirectional link between intense behavioral manifestations and placement instability, as demonstrated in the meta-analysis carried out by Oosterman et al. (2007) and in studies carried out in Québec (e.g., Esposito et al., 2015).

1.4. Study objectives

Although the use of TOPs aims to reduce the behavior escalation of youth in residential care, the present literature on trauma and instability suggests that the use of these interventions may present a risk towards a generalized aggravation of youths' behaviors resulting in further placement instability. At present, there is limited data on the effects of TOP as a behavioral management intervention. Much of the placement research literature generally excludes TOPs (Hélie et al., 2020, p. 423) making it difficult to accurately describe its effects on subsequent placement trajectories (Lee et al., 2012; Shaw & Webster, 2011; Wulczyn et al., 2007). The reality of TOP interventions is by consequence absent for methodological considerations. This omission has been criticized by a number of authors (Chambers et al., 2017; Hébert et al., 2018a, 2018b; James, 2004; James et al., 2004; Unrau et al., 2010) who point out that, independent of duration, all placements are potentially significant in a youth's life (James et al., 2004). Our study seeks to respond to this gap in the literature by using a propensity-based proxy randomization method to analyze differences between youth who have experienced a TOP and those who have not, in relation to their trajectories of other restrictive measures, behaviors and placement stability.

2. Materials and methods

2.1. Study groups

The study population (N = 3755) consisted of all youth (12–17 years old) having experienced residential care placement one day or longer in duration, between the years 2014 and 2019, in the Montréal administrative region.[2] The period of observation, therefore, ranged between 1 day and 5 years a period sufficiently long to denote inter-group and intra-group variation. Montréal was selected because, within Québec, it is the region for which the available administrative data most clearly identifies TOP interventions. Within the study population, 1243 youths had experienced at least one TOP during adolescence, representing 33% of the population and constituting the study group. In order to trace the service trajectories that youths may have experienced before adolescence and to take into account the potential effect on behaviors of events occurring within those service trajectories, a matched control group was also identified within the study population. The matched control group consisted of 1067 adolescents, selected from among the 2512 of the study population who had not experienced a TOP intervention in adolescence, who otherwise experienced childhood service trajectories equivalent to those of the study group. Specifically, the study and control groups were matched on the basis of: demographic variables, child protection services received during childhood, occurrences of various forms of substantiated maltreatment in childhood, the occurrence of post-investigation services, characteristics of placement trajectories in childhood, and the occurrence of at least one TOP in childhood. The objective of matching the two groups of adolescents on the basis of criteria preceding the period of study was to assess the net association between certain characteristics of their trajectories in adolescence and the presence or absence of TOP interventions. This strategy allows us to isolate the adolescent period or, in other words, to control for the effect of a more or less difficult childhood trajectory, which could have partially explained the results.

2.2. Data source

Québec's youth protection services collate thousands of pieces of information relative to the administration of childhood services. These clinical-administrative data are digitized and entered into Projet Intégration Jeunesse (PIJ) [Youth Integration Project], a centralized client information system. The data are subsequently validated and stored in a database of de-identified information. The data comes from the clinical notes of the professionals who work directly with youths and who are required to report interventions that restrict their freedom, such as TOPs. Given that they belong to the same organization, the researchers on this project are sufficiently familiar with the principles of variable recording to have confidence in their use and interpretation. Since context is important, they are sensitive to the context of the intervention in which the variables are recorded (D'Ignazio & Klein, 2023). The advantages of using administrative data are notorious since they are directly based on practice and, as argued by Epstein (2009) are "unintrusive" and "naturalistic". The data used in the present study were extracted from the Direction de la protection de la jeunesse de Montréal [Montréal Director of Youth Protection] database on the basis of consent granted by the ethics committee and the relevant institutions, including university committee. Therefore, the enquiry followed requisite principles of data protection.

2.3. Measurements

In order to obtain two equivalent groups, we assessed sociodemographic variables, as well as variables characterizing placement and service trajectories in childhood (see Table 1). The variables retained were: a) demographic data (sex of the child as identified in the administrative data, immigration status, deprivation status[3](refers to the neighborhood area), b) services received (presence of a substantiated investigation, age at the time of first substantiated investigation), c) presence of negligence, abuse (physical, sexual, psychological), and behavioral disturbances, as well as serious risk of negligence and abuse, d) post-investigation services (presence of services, presence of placement in care), and e) placement trajectory characteristics (duration of placement, number of moves (moves from one care unit to another and from the family to replacement), presence of placement in residential care, presence of a TOP intervention prior to the beginning of adolescence).

Subsequently, we identified events in the course of adolescence that could serve as indices of behavioral manifestation intensity. Specifically, these indices reflect measures employed in the management of behavioral manifestations, including episodes of residential care secure units, seclusion, restraint, search and seizure, and suspension from services. In addition, we identified manifestations of behaviors, such as running away from care and the presence of official delinquency. In terms of

[2] Director of Youth Protection, servicing the francophone and allophone communities, representing approximately 80% of the Montréal population.

[3] The index was constructed from six socio-economic indicators from the 2011 Canadian census: 1) total population aged 15 and over being unemployed; 2) average income of the population aged 15 and over; 3) number of people living alone; 4) population aged 15 and over whose marital status was separated, divorced, widowed; 5) median family income (Gamache et al., 2019).

Table 1
Level of significance of the difference (*t*-test) between groups before and after matching.

Childhood trajectory variables	Before matching	After matching
Sex	<.001	.772
Immigration status		
First generation	.002	.395
Second generation or more	<.001	.939
Level of deprivation (quartiles)		
Low	.774	.729
Medium-low	.045	.102
Medium-high	.861	.915
High	.491	.805
Presence of substantiated investigation	.130	.842
Age at first substantiated investigation		
0–2 years	.027	.052
3 years or older	.043	.026
Presence of negligence	.980	.892
Presence of abuse	.027	.784
Presence of serious risks (negligence and abuse)	.138	.445
Presence of behavioral disturbances	<.001	.593
Presence of post-investigation services	.501	.398
Presence of placement	.072	.939
Cumulative time in care		
No placement	.052	.023
Less than 4 years	<.001	.416
Between 5 and 12 years	<.001	.185
Number of moves (including moves from the family residence to placement)		
None	.069	.014
Between 1 and 4 moves	.076	.601
More than 4 moves	<.001	.346
Presence of placement in residential care	<.001	.916
Presence of TOP intervention in childhood	<.001	.102

placement instability indices, we identified the number of replacements in care (following failed family reunion attempts) and the number of placement moves. Finally, since the risk of having experienced a TOP intervention increases in proportion to the time spent in institutionalized care, we measured cumulative time spent in institutional placement (group homes, residential care).

2.4. Analytic model

We performed two types of analysis. First, each youth who had a TOP intervention in adolescence was matched with a youth who did not. Matching was based on propensity scores estimated using the parametric generalized linear model (GLM). With this method, a multivariate logistic regression model is used to reduce conceptually related indicators representing possible differences between youths with and without TOP (childhood trajectory). Based on the explanation given by Thoemmes (2012), the propensity score is specified as follows: $\hat{e}(x) = P(Z=1/X)$, where $\hat{e}(x)$ is the notation for the propensity score, P a probability, $Z=1$ is the presence or absence of TOP in adolescence, with values 0 for the absence of the measure and 1 for the presence of the measure, conditional on "/" the childhood trajectory covariates used to calculate propensity (X). The propensity score thus expresses the probability of experiencing a TOP in adolescence on the basis of covariates measured in childhood.

This type of matching is sometimes used in program evaluation contexts in order to control selection bias (Austin, 2011). Matching the two groups on the basis of childhood service trajectories allowed for the control of variables linked directly with this period of youths' lives and, therefore, for easier identification of results attributable to events occurring during their trajectories in adolescence. Our analysis, therefore, set the two groups on equal footing at the point of their entry in the study cohort. Descriptive analyses of matched and unmatched groups were subsequently carried out within the study population in order to understand the matching effect in adolescence.

Last, using hierarchical logistic regression, we compared the two matched groups in relation to indices of behavior manifestation intensity and placement instability in adolescence. This analysis employed four hierarchical blocks: a) **time in care** (time spent in institutional placement during adolescence) as a control variable, b) **restrictive measures** (indices of behavior intensity across different types of restrictive measures), c) **behavioral manifestations**, and d) **indices of placement instability**. The logic of the hierarchical order of the blocks is based on a presentation of the intervention context (time in care, use of restrictive measures) which may or may not explain the distinction between the groups. Thus, we first check whether the youths have experienced the other restrictive measures, since for reasons of institutional procedures, these are sometimes used in groups. We can then look beyond the procedures to observe the behavioral manifestations and then the instability.

3. Results

3.1. Group matching according to childhood trajectories

At the matching stage, we analyzed the childhood trajectories of 3755 youths in residential care (caliper = .1,[4] without replacement). A majority of youths in the study group (with at least one TOP in adolescence; n = 1067/1243) were matched with a youth from the remainder of the study population (n = 2512) in order to form an equivalent group (n = 1067) based on 12 variables characterizing their childhood trajectories (Table 1). Prior to matching, multiple variables distinguished the groups. Following matching however, the groups showed almost no differences,[5] yielding nearly equivalent group scores in relation to childhood trajectories. Since the differences are mainly found in certain variable items, we believe that these differences are smoothed out by the absence of differences for the other variable items. It should be emphasized that without this matching strategy, the differences between the groups would be more pronounced.

The matching process eliminated 176 cases of youths with a TOP for whom there were no equivalent cases in the non-TOP group; the process also eliminated the cases of 1445 youths without a TOP who were not matched. Table 2 shows variables characterizing each matched and unmatched group. Propensity score matching can result in the rejection of cases with extreme values for variables used in the model (Guo & Fraser, 2014). This methodological choice facilitated a prudent interpretation of comparative analyses, since data centering produced conservative results that nevertheless represented a significant majority of youths having experienced a TOP intervention in the course of their trajectories.

3.2. TOPs in adolescence

Descriptive analyses in Table 2 demonstrate that, for most adolescents, temporary placements categorized as TOPs occur for the first time towards the middle of adolescence, that is at 14.5 years of age on average. Matched adolescents with at least one TOP (n = 1067) had an average of 4 TOP in their trajectory. To go further, we calculate the cumulative duration in TOP that is slightly over 16 days, giving an average duration of 4 days per TOP intervention.

[4] The caliper is a threshold value, generally established at .1 (Austin, 2011), which defines the maximum acceptable difference between the propensity scores of matched youths.

[5] The groups retained slight differences in relation to the three variables of: age at first substantiated investigation, placement duration and number of move.

Table 2
Comparison of matched and unmatched groups.

Adolescent trajectory variables	Matched TOP group (n = 1067)	Unmatched TOP group (n = 176)	Sig.	Matched non-TOP group (n = 1067)	Unmatched non-TOP group (n = 1445)	Sig.
Time-out placement data						
Age at first TOP	14.51	13.07		NA	NA	
Average number of TOPs	4.17	7.36		NA	NA	
Placement trajectory data						
Age at first placement in adolescence	13.55	12.50		13.94	13.74	
Average placement duration	989.30	1286.76		735.50	827.51	
Average number of placement moves	2.63	2.99		.85	.76	
Average number of replacements	1.27	1.17		.94	.85	
Restrictive measures data						
Suspension from services (SFS)						
Occurrence of SFS	74.0%	90.3%	**	20.7%	16.7%	*
Average number of SFSs	19.86	72.02		2.00	1.45	
Age at first SFS for cases with ≥1	14.13	12.82		14.77	15.04	
Seclusion						
Occurrence of seclusion	27.4%	58.0%	**	4.7%	3.7%	
Average number of seclusions	1.84	8.73		.25	.16	
Age at first seclusion for cases with ≥1	14.34	13.22		15.38	15.09	
Restraint						
Occurrence of restraint	38.1%	65.3%	**	6.8%	5.3%	
Average number of restraints	2.12	10.55		.25	.15	
Age at first restraint for cases with ≥1	14.40	13.24		15.00	14.88	
Search and seizure (S&S)						
Occurrence of S&S	60.1%	73.3%	**	18.0%	12.2%	**
Average number of S&Ss	2.82	5.49		.66	.56	
Age at first S&S for cases with ≥1	14.70	13.53		15.11	15.56	
Residential care secure units (RCSU)						
Occurrence of RCSU	14.7%	28.4%	**	2.6%	1.7%	
Average number of RCSUs	.30	.77		.03	.02	
Age at first RCSU for cases with ≥1	15.23	14.26		15.57	15.46	
Behavioral manifestation data						
Runaway episode (RE)						
Occurrence of RE	74.2%	75.6%	–	17.2%	16.2%	
Age at first RE	14.83	14.08		15.12	15.34	
Avg. number of REs	7.83	9.36		.68	.56	
Avg. duration (days) of RE for cases with ≥1	7.19	7.06		5.87	10.21	
Official delinquency						
Occurrence of delinquent act	44.4%	54.0%	*	25.5%	20.6%	*
Age at first delinquent act for cases with ≥1	15.46	14.65		15.46	15.45	

** Indicates statistically significant differences at the $p < .001$ level; * Indicates statistically significant differences between $p < .001$ and $p < .05$ level.

3.3. Comparison of matched groups

Table 3 shows the data underpinning our principal analysis, that is, the comparison of matched groups in four hierarchical blocks. Our final model explains 57.8% of the variance between the groups. In the **Block 1 – Time in care**, as expected, the results indicate that for each additional day spent in institutional placement the risk of experiencing a TOP increase by .1% for each day spent in residential care and .2% for each day spent in group home (p = <.001).

Block 2 – Restrictive measures concentrate on the restrictive measures employed such as seclusion and restraint. The results show that adolescents who had experienced at least one restraint intervention were 1.5 times (1.582; $p = .031$) more likely to belong to the TOP group, while those having undergone at least one suspension from services were 3.5 more likely to belong to that same group (3.49; $p = <.001$). There was, however, no significant difference in relation to the variables of seclusion and residential care secure units; only a marginally significant link was obtained for search and seizure interventions.

The Block 3 – Behavioral manifestations focused on behavioral manifestations such as running away from care and official delinquency. The results indicate that adolescents who had run away were nearly 5 times more at risk of belonging to the TOP group (4.922; $p = <.001$) than those who had never run away. No significant difference between

Table 3
Factors associated with belonging to the TOP group according to logistic regression.

Indices	Beta	S.E.	Wald	Exp(b)
Block 1 – Time in care				
Time spent in RC (days)	.001	.000	2.525	1.001**
Time spent in GH (days)	.002	.000	79.814	1.002**
Block 2 – Restrictive measures				
Seclusion	−.025	.245	.010	.975
Restraint	.459	.213	4.635	1.582*
Search and seizure	.252	.142	3.138	1.287
Suspension from services	1.248	.153	66.892	3.485**
Residential care secure units	−.329	.265	1.543	.720
Block 3 – Behavioral manifestations				
Running away	1.594	.133	143.652	4.922**
Delinquent act(s)	−.076	.142	.288	.927
Block 4 – Indices of placement instability				
Number of replacements	−.038	.050	.574	.963
Number of placement moves	.179	.039	20.786	1.197**

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the groups was apparent in relation to official delinquency.

Last, the **Block 4 – Indices of placement instability** aimed to compare the equivalent groups in terms of the risk of placement instability, over and above placement duration and indices related to behavioral manifestations. The results show that each placement move raises adolescents' risk of experiencing a TOP intervention by 20% (1.197; $p = <.001$). No significant difference was noted in relation to the number of replacements in care.

4. Discussion

The propensity methodology used in this study allowed us to measure the net association between the presence of at least one TOP intervention and placement instability in adolescence. The results show that TOPs are experienced by a third of adolescents in care and that, the likelihood of experiencing a TOP increased with each additional day spent in out-of-home care. Our study also found that adolescents with at least one TOP are more likely to exhibit intense behaviors manifestations that lead to the use of more restrictive measures, including physical restraint. Adolescents who experienced at least one suspension from services were 3.5 times more likely to experience a TOP. This would suggest that these two measures are mutually associated and that some adolescents experience higher than average numbers of both brief (suspension from services) and longer (TOP) removals. Although suspensions from services and TOPs are not defined as control measures, they are nevertheless restrictive and can be viewed on the same continuum of measures such as seclusion, since they restrict the youth to a confined space (Day, 2002; Matte-Landry & Collin-Vézina, 2021; Van Dorp et al., 2021). Indeed, even without door locking, the adolescent is constrained by potential sanctions or by exclusion from their group (Day, 2002; Van Dorp et al., 2021). In the study by Van Dorp et al. (2021), the youths mentioned that in most cases, seclusion measures could and should be avoided. Multiple studies have pointed to the retraumatizing effects of such interventions and their potential to cause youths who are already particularly vulnerable to relive traumas stemming from neglect and abandonment (Matte-Landry & Collin-Vézina, 2021; Substance Abuse and Mental Health Services Administration [SAMHSA], 2014). Crucially, interventions causing an intensification of trauma can cause an intensification of youths' behavioral reactions (Briggs et al., 2012; Collin-Vézina et al., 2020; Van Dorp et al., 2021), thereby producing opposite effects to those intended. Although associative, our results tend to support this hypothesis, since adolescents who experienced at least one TOP (i.e., a potentially retraumatizing measure) experience more occurrences of restrictive measures as a function of behavioral manifestations. Indeed, the trajectories of adolescents in this group include an average of 4 TOP, no less than 20 suspensions from services, and 2 restraint interventions, all indicators of especially intense behavioral manifestations and possibly, signs of care team exhaustion. On this point, Geoffrion et al. (2021) observe that the use of restrictive interventions is frequently linked with workers' exposure to verbal violence and experience of intense emotions during the decision-making process and that, in such circumstances, some practitioners become "super-users" of restrictive measures.

However, the trajectories of adolescents having experienced at least one TOP are not characterized by higher occurrences of seclusion, search and seizure, or residential care secure units when compared with the trajectories of adolescents without TOP interventions. In effect, the use of residential care secure units, seclusion, and search and seizure measures cannot account for differences between the groups over and above the effect of other variables. It is possible that care workers perceive the use of TOPs, suspensions from services, and restraint interventions as more accessible during episodes of intense behavioral manifestations in contrast to lock down measures involving door locking (seclusion, residential care secure units), which they perceive as more extreme and which require managerial approval. This hypothesis is worthwhile testing in future studies of the use of restrictive measures.

Second, each occurrence of running away from care increases adolescents' risk of experiencing a TOP by a factor of five. This suggests that the use of TOPs in the context of youths' running away from care, whether preceding or subsequent to it, may be commonplace. The systematic review by Roy et al. (2019) of 23 studies (USA, Canada, Australia, Scotland) on restrictive measures in residential care also found that the characteristics of youth, including oppositional and aggressive behavior but also running away, were associated with a higher risk of experiencing restrictive measures. The literature also shows that run away youth have a higher occurrence of mental health difficulties than do youth who do not run away (Whitbeck et al., 2004) and have a higher tendency towards risk taking (Couture et al., 2021). Risk-taking behavior, in turn, may represent attempts to dissociate from suffering (Salmona, 2018). Importantly, risk taking through running away may exacerbate youths' mental health difficulties and engender additional traumas (Hamel et al., 2012; Laurier et al., 2022). Rana and Robert (2013) suggest that running away may be an attempt to adapt to needs unfulfilled in care placement, such as the needs to develop relational connections, one's power to act, and emotional regulation. For these youths, running away has potentially become a learned reflex, a common strategy for traumatized individuals in response to perceived threats (Collin-Vézina et al., 2020). Critically, this runaway strategy may become ingrained over time if youths are subject to recurrent interventions that remove them from their care environment, including TOPs, in order to "manage" their behaviors. Moreover, the frequency of running away from care among adolescents having experienced at least one TOP may lead to them losing their place in their residential care unit. Running away from care, therefore, can be considered as a marker of placement instability (Hébert et al., 2016).

Lastly, our results demonstrate that, independent of time spent in residential care and of intense behavioral manifestation, adolescents whose trajectories include moves between care units are more likely to experience a TOP intervention. Specifically, the likelihood of a TOP increases by 20% with each additional placement move. A recent study by Clark et al. (2020) suggests that youth' placement instability increases in proportion with the presence of traumatic symptoms. Given that one of the arguments for the use of TOPs is their capacity to stabilize youths within their principal residential care unit, our results point to significant shortcomings in the efficacy of this approach to stabilization. Significantly, in addition to the 2.6 placements moves experienced by adolescents in the TOP group (Table 2), their trajectories also include an average of 4 transfers to and from TOPs (which are not tabulated as placement moves between care units), as well as almost 8 episodes of running away from their residential care unit. Taking all these events into consideration, we can state that short-term placements like TOPs, initiated in response to behavioral manifestations are associated with significant and variegated placement instability among youths in care. This finding is especially important because, given our matching strategy, it cannot be explained in relation to more adverse or unstable childhood trajectories. It is important to note that the matching process also eliminated from the analysis cases of youth who had experienced a TOP and whose childhood trajectories exhibited the most severe difficulties, as well as youths who had not experienced a TOP and whose childhood experiences were less severe. In other words, without matching based on childhood trajectories, the difference between the two groups in terms of placement instability would be even more pronounced. Since TOPs are disciplinary placement interventions deployed in response to behavioral manifestations, they are intrinsic to that association between behavior and placement instability and appear to be symptomatic of generalized difficulties for which residential care services do not have easy answers.

4.1. Limitations

The present study has certain limitations that confine the scope of our results. First, the chosen study design produced associative results. It

did not enable us to establish a sequence of events that would lead to a better understanding of the sequential development of intervention processes in residential care. Consequently, we do not know, for example, whether TOPs occur prior or subsequent to suspensions from services or runaway episodes, nor what periods of time separate these events from TOP interventions. A more detailed analysis of timelines of event occurrence could shed light on the onset of dynamics in which reactive behavior combines with restrictive interventions and placement moves. Second, as mentioned above, our method of analysis centered data and excluded outlying values. Consequently, it underestimated the difference between youths who had experienced a TOP and those who had not, producing more robust, but also more conservative, results. Third, our study relied on clinical-administrative data. The validity of this data depends on the rigor with which the contributors and managers feed the database. In this respect, collection rules are sometimes better known and verified for certain variables, and less so for others. That said, data corresponding to placements trajectories are generally the most reliable, since they are associated with money outflows. In addition, these data have the advantage of being practice-based and therefore have a direct effect on improving practices (Epstein, 2009).

5. Conclusion

The difficulties experienced by youth in care and the intensity of their behavioral manifestations pose a daily challenge for care workers in residential care contexts. The majority of these youth have been traumatized by adults ostensibly in charge of their wellbeing and they can exhibit acute reactions to situations of stress brought on by perceived threats. It is possible that these reactions are adaptations to the range of abuse and neglect experienced in childhood. Our study shows that intense behavioral manifestations, such as running away, are especially present in the trajectories of youth who also experience a TOP intervention. Perhaps through concern for safety, it appears that care workers are more prone to use interventions such as TOPs when faced with youths' behavioral manifestations. The efficacy of TOPs remains ambiguous, however, both clinically (e.g. alleviating stress) (Hébert et al., 2024) and in relation to placement stability. Since youth in care who undergo placement move may perceive it as rejection (Barber et al., 2004; Bergeron, 2006; D'Andrade, 2005; Hébert et al., 2016), it appears that responses to their sometimes intense behavioral manifestations may, in fact, contribute to further escalate their behavior (Blaustein & Kinniburgh, 2018; Collin-Vézina et al., 2020).

Given all of the above, the accumulation of restrictive measures experienced by youth in care could potentially be interpreted as the insensitive management of their behavioral manifestations on the part of care workers. Our perspective, however, is that of a system which fails to provide adequate support for care practitioners who work "at the front" every day and who must face the challenge of behavioral manifestations. At the moment, youth protection services are designed in such a way that it is the youths themselves who bear responsibility for the abusive or neglectful experiences in their families. Furthermore, these families are often themselves part of social contexts marked by inequality, poverty and lack of access to resources (Esposito et al., 2017, 2022) In this context, care workers frequently perceive few options other than behavior reduction, forgoing measures that could effectively alleviate youths' emotional distress. In order to disengage the reactive cycle, many clinicians and researchers insist on the necessity of rethinking current response approaches to the needs of youth in care in order to ensure that care becomes more trauma sensitive (Milne et al., 2021; Poole et al., 2013). Recommendations for reforms to the intervention paradigm of youth protection services and institutions, as well as calls to humanize care services, have abounded in recent years (Clark et al., 2020; Collin-Vézina et al., 2020; Commission spéciale sur les droits des enfants et de la protection de la jeunesse (CSDEPJ) [Special Commission on the Rights of the Child and Youth Protection], 2021). A true understanding of traumas experienced by vulnerable youths is contingent on an acknowledgement of their needs for physical and emotional safety and of their freedom to choose and control the interventions they receive (Poole et al., 2013). For critical authors such as Birnbaum (2019), however, this means resisting the overuse of trauma as a generic theme, and instead understanding the individual and his or her needs in a broader social and temporal context. For this study, the behaviors of youths, although intense, make sense in the context of their lives if we pay attention to them. Our recommendation to be sensitive to trauma is a recommendation to remain sensitive to the whole context that has surrounded (family, society) and is currently surrounding the child (institution). For this to happen, young people need to be recognized and listened to, and to be involved in making decisions about their lives. A study of their participation in the decision-making process that precedes the use of TOP is currently underway, as is a review of the clinical objectives of TOP with the collaboration of youths. Trauma sensitivity training for care workers could also contribute to at least a partial decrease in the use of disciplinary measures, such as TOPs (Matte-Landry & Collin-Vézina, 2021). But, in order to bring about real change in intervention approaches, it is necessary also to review the automatization and standardization of measures that result in intervention dilemmas for care workers in the absence of access to other methods (Collin-Vézina et al., 2020; Hébert et al., 2024). Thus, the use of TOPs and other disciplinary measures may, in fact, be a symptom of a collective incapacity to respond constructively to the suffering of youth in care.

CRediT authorship contribution statement

Sophie T. Hébert: Writing – original draft, Validation, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization, Writing – review & editing, Validation, Methodology. **Sonia Hélie:** Writing – review & editing, Validation, Methodology, Funding acquisition, Formal analysis, Conceptualization. **Marie-Noële Royer:** Writing – review & editing, Visualization, Methodology, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Sophie T. Hebert reports financial support was provided by Government of Canada Social Sciences and Humanities Research Council. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix

Appendix A

Types of restrictive measures used in Québec

Type of restrictive measure	Objective	Specific measure and additional restriction used (where applicable)	Measure duration
Security measures	Aims to remove objects or substances that are illegal, prohibited or posing a danger to the youth or others	Search and seizure	Momentary
Disciplinary measures	Aims to respond to behaviors significantly divergent from established rules or code of conduct of care unit	Suspension from services Time-out placement	Several minutes to several hours Multiple days
Control measures	Aims to respond to imminent danger to the youth or others	Restraint (*use of force*) Seclusion (*door locking*) Residential care secure units (*door locking*)	Momentary Several minutes to several hours Multiple days

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