

FAMILY ACCOMMODATION IN INTENSIVE/RESIDENTIAL TREATMENT FOR
ADULTS WITH OCD: A CROSS-LAGGED PANEL ANALYSIS

By

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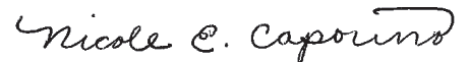
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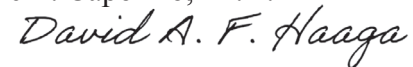
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ABSTRACT

Many adults with OCD experience residual symptoms following CBT, with or without medication. A potential target for enhancing treatment effectiveness is family accommodation (FA). This study examined 1) possible sociodemographic and clinical correlates of FA in adults presenting for intensive/residential treatment, and 2) temporal relationships between FA and OCD symptom severity during acute treatment and follow-up phases. Adult patients ($N = 315$) completed baseline measures of FA and OCD symptom severity at admission to IRT. Follow-up data were collected from a subset of participants ($n = 111$) at discharge, 1-month, and 6-month follow-up. Cross-lagged panel analysis showed that changes in OCD symptom severity from admission to discharge predicted changes in FA from discharge to 1-month follow-up. Increases in FA from discharge to 1-month follow-up predicted increases in OCD symptom severity from 1-month to 6-month follow-up. Females reported greater baseline FA than did males, and there were no significant differences in FA by relationship type or marital status. Contamination, Responsibility for Harm, and Symmetry/Incompleteness symptoms were each found to uniquely predict FA at admission. Treatment outcomes may be optimized by intensifying the focus on FA as patients transition home to support the maintenance of treatment gains.

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CHAPTER 1

INTRODUCTION

Obsessive-compulsive disorder (OCD), a chronic, potentially debilitating disorder characterized by the presence of intrusive obsessions and/or compulsions (American Psychiatric Association, 2013), affects an estimated 1-2% of the adult population in the United States (Ruscio et al., 2010). While cognitive-behavioral therapy with exposure and response prevention (ERP; Foa et al., 2005) is considered the “gold standard” intervention for OCD, approximately 40% of individuals do not recover with a course of outpatient treatment (Fisher & Wells, 2005). Moreover, adults in intensive/residential treatment for severe OCD experience, on average, only a 30% reduction in symptoms from admission to discharge (Stewart et al., 2005). Research to elucidate the mechanisms by which OCD is maintained following treatment is needed to identify ways in which established interventions can be enhanced/modified to maximize their effectiveness. One potential treatment target that warrants further investigation is family accommodation of OCD symptoms, which is highly prevalent in clinic-referred cases of OCD (Calvocoressi et al., 1995).

Family accommodation (FA) is characterized by the participation of a family member in obsessive-compulsive symptoms (Calvocoressi et al., 1995). This may include direct participation in rituals, facilitation of avoidance, providing reassurance, or modification of family routine to assist with the individual’s OCD. While typically performed with intent to promote functioning or reduce the affected individual’s anxiety/distress, FA ultimately prevents violation of expectancies and habituation to the distress experienced in the face of obsessions, maintaining or exacerbating OCD symptoms. In cross-sectional studies, greater FA has been consistently linked to greater OCD symptom severity and worse functional impairment (e.g., Ferrao et al.,

2006; Garcia et al., 2010; Gomes et al., 2014; Storch, Larsen et al., 2010). Indeed, in pediatric samples, FA has been found to mediate the relationship between symptom severity and caregiver-rated functional impairment (Caporino et al., 2012). This is consistent with the possibility that FA worsens functional impairment despite alleviating distress in the short-term.

Correlates of Family Accommodation

Though predominantly studied in youth, FA is salient and clinically relevant across the lifespan (e.g., Lebowitz et al., 2012). For example, in a study of relatives of adults with OCD, 97% of respondents endorsed at least some accommodation, with over half endorsing daily accommodation (Stewart et al., 2008). Research has demonstrated that, in adult samples, FA occurs independent of the age of the individual or of the family member (e.g., Stewart et al., 2008; Albert et al., 2010; Gomes et al., 2014). In a meta-analysis including both youth and adult samples, age (examined as both a categorical and continuous variable) did not have a statistically significant effect on the relationship between FA and OCD symptom severity (Wu et al., 2016). Moreover, Thompson-Holland and colleagues (2015) found that the effects of a family-inclusive treatment that targeted FA on OCD symptoms and functioning were robust across age groups. While there is no evidence to support that age relates to the magnitude of FA, it is possible that specific accommodating behaviors vary by age due to developmental contexts. For example, in their 2017 review, Albert and colleagues found that parents of children tended to directly participate in rituals and endorsed fewer modifications of personal/family routine than did the family members of adults with OCD. Similarly, family members of adults have most frequently reported providing reassurance, whereas participation in rituals was reported least frequently (e.g., Stewart et al., 2008; Albert et al., 2010). Only one of these studies sampled adults in

intensive/residential treatment; more data on types of accommodation exhibited by families of patients in this setting are needed.

While prior research has largely focused on the accommodating behaviors between caregivers and youth, FA in adults may differ by type of relationship (e.g., partner, sibling, offspring). Adults with OCD are less likely to be married than those without OCD (Koran, 2000), and it has been reported that nearly 25% of treatment-seeking adults with OCD live with their parents (Steketee & Pruyne, 1998). Indeed, in a sample of adults receiving intensive/residential treatment for OCD, nearly one half (48%) were reported to be living with their parents (Stewart et al., 2008). Marital status, however, has not been found to be associated with FA or response to ERP treatment (e.g., Albert et al., 2010; Hoogduin & Duivenvoorden, 1988). Findings related to differences in FA by type of relationship have been mixed; Gomes et al. (2014) reported higher levels of FA by spouses compared to other types of family members, whereas prior research suggested that FA is not dependent on the family member's relationship to the affected individual (Albert et al., 2010). One possible explanation for this discrepancy is differences in sample characteristics across studies. Specifically, Albert et al. (2010) excluded family members with current or lifetime mental disorders, whereas Gomes et al. (2014) reported that 28% of family member participants endorsed clinically significant OCD symptoms.

Pediatric studies have supported the positive association between parental psychopathology (including parental OCD symptoms) and FA (e.g., Storch et al., 2007; Peris et al., 2008). Family members with OCD symptoms may be more likely to engage in accommodation of symptoms experienced by clinic-referred adults as well.

A positive association between FA and OCD symptom severity has been reported in pediatric and adult studies alike (e.g., Ferraro et al., 2006; Garcia et al., 2010; Gomes et al.,

2014; Storch, Larsen et al., 2010). Due to the limitations of cross-sectional design, however, the extent to which this relationship is bidirectional is unclear. On one hand, family members may be more likely to engage in accommodating behaviors when OCD symptoms are severe in an attempt to alleviate the affected individual's distress and facilitate functioning. Conversely, FA may contribute to more severe OCD symptoms by interfering with habituation to obsessional anxiety and violation of expectancies, and by reducing motivation for change (e.g., Caporino et al., 2012).

Research has demonstrated a significant association between the presence of contamination-related symptoms and increased FA (Stewart et al., 2008), as well as a significant positive relationship between contamination-related symptoms and FA, even after controlling for overall illness severity (Albert et al., 2010). The latter finding suggests that contamination-related symptoms, specifically, may elicit greater accommodating behaviors compared to other symptom subtypes. Family members of adult patients with primary contamination symptoms have reported substantial changes in their daily activities/routine to accommodate the affected individual's symptoms (Albert et al., 2010). Stewart and colleagues (2008) sampled families of adults who presented for partial hospitalization or residential treatment and found significantly higher levels of accommodation by facilitating compulsions for adults with, compared to without, contamination symptoms. The presence of primary contamination-related symptoms may signal the need for greater family involvement in treatment.

Females may be particularly vulnerable to high levels of accommodation from family members, as they have endorsed contamination symptoms – which have been linked to heightened FA (Stewart et al., 2008) - at higher rates than have males (e.g., Labad et al., 2008; Mathis et al., 2011). Moreover, in Western culture, parents communicate to females more than

males that they are vulnerable in risky situations (Morrongiello & Dawber, 2000), and females are more expressive, both verbally and non-verbally, of fear and sadness (e.g., Allen & Haccoun, 1976; Kring & Gordon 1998) – possibly eliciting greater accommodation from family members compared to males. However, several studies that sampled adults with OCD have not supported a relationship of FA to gender of the affected individual or family member (e.g., Gomes et al., 2014; Albert et al., 2010; Flessner et al., 2009; Stewart et al., 2008).

Family Accommodation as a Treatment Target

Greater FA has predicted relatively poor treatment outcome in pediatric OCD (e.g., Merlo et al., 2009; Garcia et al., 2010) and therefore has become a treatment target in refined protocols. A randomized controlled trial testing the efficacy of exposure-based CBT plus a structured family intervention (FCBT) for the treatment of OCD in youth found that those who received FCBT demonstrated greater change in OCD symptom severity, functional impairment, and FA compared to those that received psychoeducation plus relaxation training (Piacentini et al., 2011). Although family involvement in the treatment of OCD in youth is typically indicated for pragmatic reasons (e.g., facilitating exposure), making it easier to target FA, there is evidence to support potential benefit to involving families in the treatment of OCD in adults as well (e.g., Calvocoressi et al., 1995). For example, in a waitlist-controlled trial, Gomes et al. (2016) found significant improvements in OCD symptoms and FA following a cognitive-behavioral group therapy intervention with brief involvement of family members. More recently, a brief, 6-session intervention that combined ERP, psychoeducation, and family intervention resulted in significant reductions in OCD symptom severity and FA, with those in the intervention group exhibiting a better response at 3-month follow-up compared to those in the relaxation control condition (Baruah et al., 2018). Furthermore, Thompson-Hollands and colleagues (2015) developed and

tested an adjunctive intervention designed to reduce FA; adults whose family members received the intervention demonstrated greater reduction in OCD symptom severity compared to those that received ERP alone, and change in FA from baseline accounted for a significant amount of variance in later OCD symptoms. Taken together, these results highlight the potential to enhance the efficacy of CBT for adults with OCD by intensifying the focus on family factors.

Overall, family-integrated treatment has been found to outperform individual ERP on reduction of FA, reduction of OCD and depression symptoms, and improvement in functional impairment across outpatient settings (see meta-analysis by Stewart et al., 2020). More specifically, interventions that specifically targeted FA were significantly associated with larger effects on functional impairment (Thompson-Holland et al., 2015) and greater reductions in patient-reported depression (Stewart et al., 2020) compared to those that did not explicitly address FA. Moreover, in an outpatient sample consisting primarily of treatment-refractory individuals (with an average of 2.82 years of treatment prior to participation), a family-only group intervention to target FA conducted concurrently with individual ERP was found to result in greater reductions in OCD symptoms at post-treatment and 1-month follow up compared to ERP alone (Grunes, Neziroglu, & McKay, 2001). Meta-analytic reviews of family-integrated treatment for adults with OCD did not find significant moderating effects of the format of treatment (i.e., individual vs. group), treatment length in weeks, or dosage of family member involvement on OCD symptom outcomes (Thompson-Holland et al., 2015; Stewart et al., 2020).

It remains unclear whether FA, specifically, is reduced following treatment as a consequence of reduced OCD symptom severity or whether CBT is effective, in part, because it reduces FA directly, such that family members do not undermine treatment (Albert et al., 2017). At least one study that sampled youth in an outpatient clinic suggested that FA drives, at least

partially, OCD symptom severity; a reduction in FA was found to precede OCD symptom improvement in CBT with ERP (Piacentini et al., 2011). Furthermore, another pediatric study found that changes in FA in the latter half of treatment preceded improvement in OCD symptom severity (O'Connor et al., 2021). No studies conducted with adults have directly examined the possibility that treatment-related change in FA precedes change in OCD symptoms.

Family Accommodation and IRT

A subset of individuals with OCD do not respond to first-line treatments including both ERP and pharmacological approaches (e.g., selective serotonin reuptake inhibitors). This treatment-refractory subset has been reported to account for nearly all of the OCD-related psychiatric hospitalizations in the United States (Ruscio, et al., 2010). Intensive/residential treatment (IRT) is a treatment option for those with severe OCD whose symptoms do not improve with standard outpatient care. In a study examining adults receiving IRT for OCD, over half of participants had received prior treatment with a combination of behavioral therapy and medications, and an additional 32% reported receiving either behavioral therapy or medications prior to admission to the program; nonetheless, participants reported highly severe symptoms at admission (Brennan et al., 2014).

Specialized IRT programs typically combine psychopharmacology, intensive behavior therapy, and group therapy. While relatively little is known about the role of FA in OCD among adults receiving higher levels of care, there is evidence from the pediatric literature that FA has predicted treatment outcome across treatment modalities (e.g., CBT, medication, and their combination; Garcia, et al. 2010). In a case-control study comparing adults with treatment-refractory OCD (i.e., poor response to CBT and first-line medications with augmentation) and

treatment-responders, the refractory group demonstrated significantly higher FA scores than did the responder group (Ferrao et al., 2006).

Because there are a limited number of facilities in the United States that offer comprehensive IRT for OCD, attending these programs may necessitate substantial travel for many individuals. Given that patients are either completely removed from or spending far less time than usual with family members, the nature and extent of family involvement in IRT may differ from that in outpatient care. For example, the varying physical proximity/access to a patient's family members may limit opportunities to observe FA or the ability to target FA during the acute phase of treatment. Even if assessed accurately, the level of FA that occurs in residential treatment may not be representative of a family member's accommodating behaviors when the affected individual is home. Additionally, the true prevalence of FA may differ among IRT patients (relative to outpatients) given that most have already received treatment in which FA could have been targeted. One study reported that 65% of participants attending an IRT program for OCD had previously received ERP (Wadsworth et al., 2020). In this context, it's possible that FA may have been effectively targeted in previous treatment, yet OCD symptoms persist in severe cases largely due to biological influences. For example, basal ganglia dysfunction has been implicated in the etiology of OCD, with research suggesting a relationship between altered cortical connectivity and OCD symptom severity (Macpherson & Hikida, 2019).

Importantly, while there is evidence to support the effectiveness of IRT in reducing OCD symptom severity over the course of treatment (e.g., Bjorgvinsson et al., 2013; Veale et al., 2016), far less is known about the long-term outcomes of IRT. It is unclear whether gains are maintained and generalize to contexts beyond the residential treatment setting (i.e., when the individual returns home), especially for those in which family factors play a prominent role in

the maintenance of symptoms. If FA attenuates OCD symptom reduction, treatment outcomes may be optimized by targeting FA as patients transition to the home environment in order to ensure that treatment gains generalize to the family context and decrease likelihood of symptom relapse.

Study Aims

The proposed study explored possible sociodemographic (gender, marital status, relationship type) and clinical correlates (OCD symptom type and severity) of FA among adults receiving IRT for OCD. In line with previous research, we predicted that FA would be positively correlated with contamination-related symptom severity and overall OCD symptom severity. Further, we investigated the temporal relationships between FA and OCD symptom severity during the acute treatment and follow-up phases. Based on results from pediatric research (e.g., Piacentini et al., 2011; Merlo et al., 2009), we hypothesized that 1) change in FA from baseline to discharge predicted change in OCD symptom severity from discharge to 1-month follow-up, and 2) change in FA from discharge to 1-month follow-up predicted change in OCD symptom severity from 1-month to 6-month follow-up, such that the direction of change in OCD symptom severity would be consistent with the direction of change in FA.

CHAPTER 2

METHOD

Participants

Participants were 315 adults (age ≥ 18 years) admitted consecutively for specialized IRT for OCD (50% female, $M = 29.6$ years old, $SD = 10.4$). Participants completed a self-report demographics form at admission to the program. Demographic data are provided in Table 1.

Table 1.
Sample Characteristics Reported at Admission

	Overall sample <i>n</i> (%)	Follow-up sample <i>n</i> (%)
Gender		
Male	156 (50)	50 (45)
Female	159 (50)	61 (55)
Race/ethnicity		
African American	7 (2)	2 (2)
American Indian/Alaska Native	5 (2)	3 (3)
Asian	9 (3)	2 (2)
White	212 (67)	77 (69)
Latino/Latina	8 (3)	1 (1)
Multiracial	14 (4)	7 (6)
Do not know	13 (4)	6 (5)
Other	25 (8)	6 (5)
Not reported	22 (7)	7 (6)
Relationship status		
Single	195 (62)	75 (68)
Partnered	49 (16)	16 (14)
Married	42 (13)	12 (11)
Separated	2 (1)	-
Divorced	5 (2)	1 (1)
Not reported	22 (7)	7 (6)
Employment status		
Unemployed	129 (41)	38 (34)
Working full-time	38 (12)	15 (14)

Working part-time	28 (9)	11 (10)
On leave from work/school	57 (18)	19 (17)
Student	41 (13)	21 (19)
Not reported	22 (7)	7 (6)
Household annual income		
Less than \$10,000	41 (13)	9 (11)
\$10,000 - \$19,999	15 (5)	2 (2)
\$20,000 - \$29,999	15 (5)	4 (5)
\$30,000 - \$39,999	14 (4)	9 (11)
\$40,000 - \$49,999	16 (5)	4 (5)
\$50,000 - \$59,999	22 (7)	6 (7)
\$60,000 - \$69,999	22 (7)	8 (10)
\$70,000 - \$79,999	14 (4)	2 (2)
\$80,000 - \$89,999	13 (4)	5 (6)
\$90,000 - \$99,999	13 (4)	3 (4)
\$100,000 - \$149,999	46 (15)	10 (12)
Greater than \$150,000	62 (20)	22 (26)
Not reported	22 (7)	-
	<i>M (SD)</i>	<i>M (SD)</i>
Age	29.6 (10.4)	34.4 (15.7)
Age of onset (self-report)	12.6 (7.8)	11.9 (8.3)
DOCS admission	28.29 (15.37)	30.70 (13.90)
FAS-PV admission	19.55 (16.79)	23.64 (14.83)
DOCS discharge	-	16.93 (11.92)
FAS-PV discharge	-	7.13 (9.82)
DOCS 1-mo follow-up	-	16.04 (10.92)
FAS-PV 1-mo follow-up	-	5.57 (7.25)
DOCS 6-mo follow-up	-	17.77 (13.22)
FAS-PV 6-mo follow-up	-	6.75 (9.72)

Note. DOCS = Dimensional Obsessive-Compulsive Scale total score at admission; FAS-PV = Family Accommodation Scale-Patient Version at admission.

The average age of onset was 12.6 years ($SD = 7.8$), and 77% reported previous ERP. At the time of admission, 82% of the sample had been prescribed psychiatric medication. The most common comorbid diagnoses were major depressive disorder ($n = 69$), persistent depressive disorder ($n = 49$), and social anxiety disorder ($n = 37$). Follow-up data were collected from a subset of participants ($n = 111$) who did not differ from those without follow-up data on any study measures (p -values ranged from .22 to .93, n.s.).

Measures

Dimensional Obsessive-Compulsive Scale (DOCS; Abramowitz et al., 2010). The DOCS was used to assess the severity of OCD symptom types: Contamination, Responsibility for Harm and Mistakes, Unacceptable Thoughts, and Symmetry/Incompleteness. The DOCS consists of 20 items rated by patients on a scale from 0 (No symptoms) to 4 (Extreme symptoms). The reliability and validity of the DOCS have been established (Abramowitz et al., 2010). The DOCS total score, particularly, has been shown to discriminate individuals with OCD very well from non-clinical individuals and from those with other anxiety disorders. Abramowitz and colleagues (2010) found the mean total score to be 30.06 among those diagnosed with OCD; the mean total score in the current study was 30.70. In the current study, Cronbach's alpha ranged from .93 to .97 for subscales and was .89 for the total score.

Family Accommodation Scale – Patient Version (FAS-PV; Wu et al., 2016). The FAS-PV was used to assess the frequency of accommodation over the past week (e.g., *My relative avoided talking about things that might trigger my obsessions or compulsions; My relative provided me with items I need to perform rituals or compulsions*). The FAS-PV was adapted from the clinician-administered instrument developed by Calvocoressi and colleagues (1999) and consists of 19 items rated on a scale from 0 (None/never) to 4 (Every day this past week). The

FAS-PV has demonstrated moderate convergent validity with the family self-reported version ($r = .58$; Wu et al., 2016). Concurrent and discriminant validity of the FAS-PV have been supported by stronger associations with OCD symptom severity, OCD-related family impairment, anxiety, and functional impairment than impulsivity and depressive symptoms (Wu et al., 2016). In the present study, the FAS-PV had a Cronbach's alpha of .92.

Procedure

Treatment was based on principles of CBT, with a focus on ERP. Each participant met weekly with an assigned psychiatrist, behavioral therapist (doctoral-level or master's-level), and family therapist (master's-level). Although clinicians did not follow a structured treatment manual, they established an idiographic, exposure-based treatment plan based on their assessment and conceptualization of the participant's symptom presentation. All participants received psychoeducation about OCD and the rationale for ERP. Participants engaged in 4 hours of ERP per day; at least 2 hours were completed with an exposure coach (e.g., bachelor's-level practitioners and advanced graduate students), with the remaining hours self-directed. Additionally, participants received symptom-specific group therapy weekly. Average length of stay, which depends on clinical necessity and insurance coverage, was 57.9 days ($SD = 25.4$).

Diagnostic assessments were conducted within the first 2 weeks of treatment by trained research staff/practicum students, supervised by a licensed psychologist. Diagnoses were assigned using the Structured Clinical Interview for the DSM-5 (First et al., 2015) for 79% of the participants; the remaining participants were assigned diagnoses by their program behavioral therapist. Participants were administered self-report measures at admission to and discharge from treatment. Self-report follow-up measures were emailed to participants 1-month and 6-months following discharge.

All measures and procedures were approved by the Institutional Review Board at the data collection site, and written informed consent was obtained from all participants included in the study. Study procedures were also approved by the American University Institutional Review Board (study #: IRB-2021-216).

Analytic Plan

Statistical assumptions (multivariate normality, homoscedasticity, multicollinearity) were evaluated prior to hypothesis testing, and there were no meaningful violations. Descriptive statistics (e.g., mean, standard deviation, range) were calculated for all variables. One-way analyses of variance compared the relationships between marital status and relationship types on FA. An independent-samples *t*-test examined whether FA significantly differed by gender. Pearson correlations examined associations of FA to OCD symptom severity. Multiple regression examined OCD symptom dimensions as predictors of FA at admission.

Structural equation modeling tested the reciprocal and longitudinal relations between FA and OCD symptom severity among those participants with follow-up data ($n = 111$). A cross-lagged panel model was constructed using the lavaan package in R (Rosseel, 2012) to assess the directional effects between FA and OCD symptom severity over time (see Figure 1; $n = 111$ at admission, $n = 98$ at discharge, $n = 94$ at 1-month follow-up, $n = 74$ at 6-month follow-up).

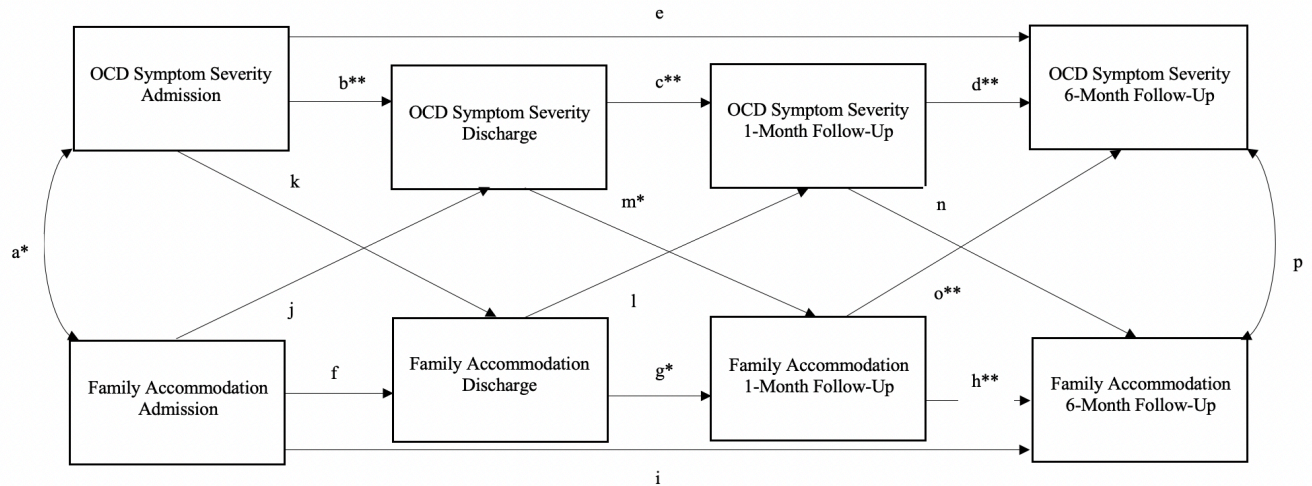


Figure 1. Path Model for Effects of OCD Symptom Severity and Family Accommodation. OCD Symptom Severity = Dimensional Obsessive-Compulsive Scale (DOCS) total score. Family Accommodation = Family Accommodation Scale – Patient Version (FAS-PV).
 * $p < .05$;
 ** $p < .01$.

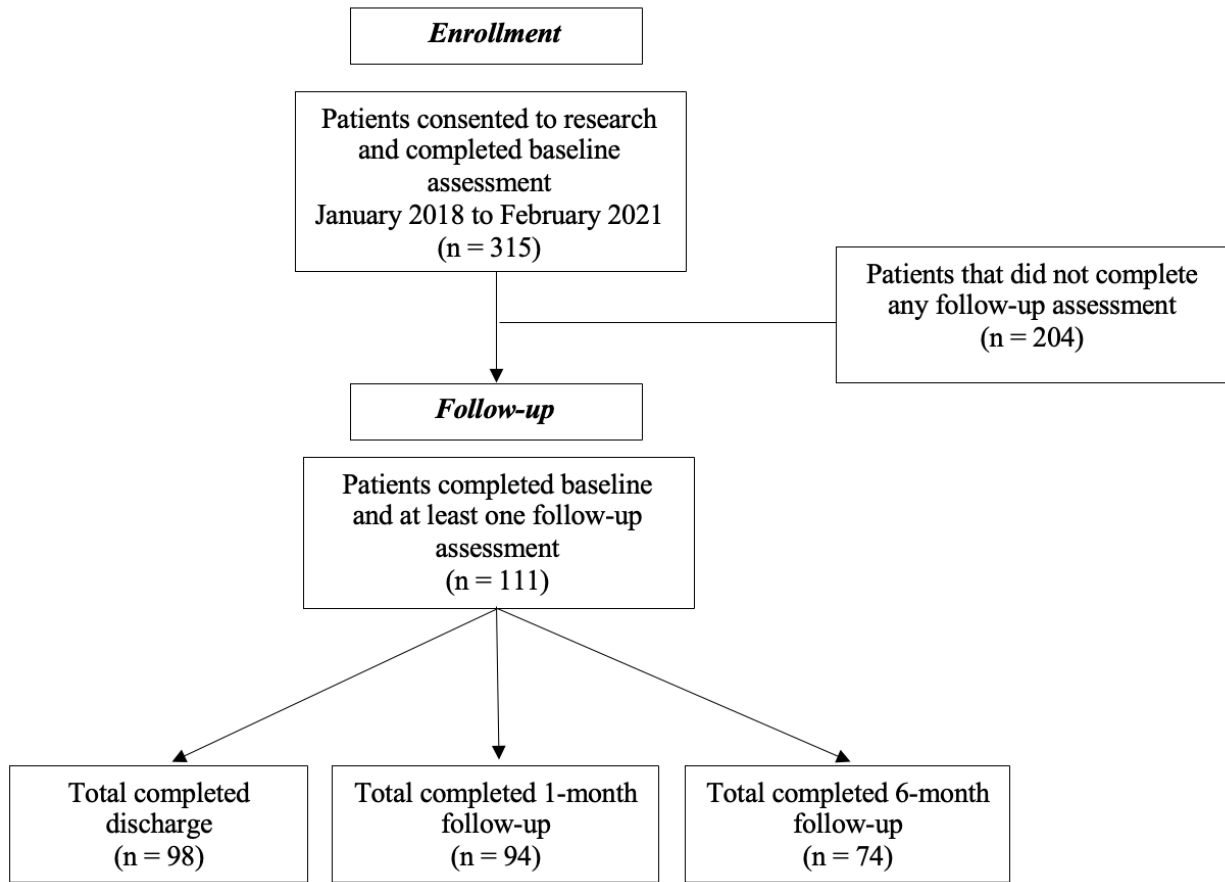


Figure 2. CONSORT Flow Chart of Study Participants

Cross-lagged modeling accounts for both inertial effects (i.e., the influence of a variable at time 1 on the same variable at time 2) and possible reciprocal effects (i.e., the influence of a variable at time 1 on another variable at time 2 and vice versa). More specifically, the cross-lagged parameter estimate indicates the extent to which the change in one variable (i.e., y) can be predicted from the individual's prior deviation from the group mean on another variable (i.e., x), while controlling for the structural change in y , and the individual's prior deviation from the group mean on y (Finkel, 1995). Full information maximum likelihood estimation was used to handle missing data, which were missing completely at random ($\chi^2 = 35.003, p = .2$; Little, 1988).

Model fit was assessed using multiple fit indices. A well-fitting model is suggested by a non-significant chi-square, a comparative fit index (CFI) and a Tucker-Lewis index (TLI) of above .90, and a root-mean-square error approximation (RMSEA) below .08 (Kline, 2005). To facilitate interpretation, standardized path estimates are reported.

CHAPTER 3

RESULTS

Table 1 shows descriptive statistics for baseline FA and OCD symptom severity. Independent-samples *t*-tests and chi-square tests of independence revealed no significant differences in baseline characteristics between those with and without follow-up data. Nearly all participants (92.7%) reported at least one type of accommodating behavior in the past week; 24% of participants reported daily accommodation. There was a significant difference in mean FA at admission between males and females, $t(306.218) = -2.850, p < .01$, such that FA was significantly higher, on average, for females ($M = 22.18, SD = 17.93$) than for males ($M = 16.86, SD = 15.14$). There were no significant differences in baseline FA by relationship to the accommodating family member or marital status.

FA and DOCS total scores were positively correlated at admission, $r = .42, p < .01$. A significant regression equation was found ($F(4, 310) = 22.530, p < .01$), with an R^2 of .23. FA was significantly associated with severity of Contamination, $\beta = .83, p < .01$, Responsibility for Harm, $\beta = .62, p < .01$, and Symmetry/Incompleteness symptoms, $\beta = .37, p < .05$. Severity of Unacceptable Thoughts did not significantly predict FA at admission ($\beta = -.04, p = .79$).

Temporal Relationships between FA and OCD Severity

Subsample means reflect decreases in both FA and OCD symptom severity from admission to discharge and from discharge to 1-month follow up. Mean scores of FA and OCD symptom severity increased from 1-month follow-up to 6-month follow-up.

Examination of fit indices revealed that the cross-lagged panel model had adequate model fit: the model chi-square was not significant ($\chi^2 = .28$), the comparative fit index was above .99, root mean square error of approximation was .04, and the close-fit hypothesis was not rejected

because the lower bound of the confidence interval was less than .05; however, the poor-fit hypothesis cannot be rejected since the upper bound of the confidence interval exceeded .1. This type of mixed outcome is likely to happen in smaller samples (Breivik & Olsson, 2001).

Figure 1 presents the model tested. Regarding interpretation of path coefficients, path *a* in the model represents the correlation between FA and OCD symptom severity at admission. Paths *b*, *e*, *f*, and *i* are stability coefficients that reflect the stability of OCD symptom severity and FA from admission to discharge (paths *b* and *f*) and from admission to 6-month follow-up (paths *e* and *i*). Paths *c* and *g* are stability coefficients that reflect the extent to which change in a variable from admission to discharge is associated with change in the same variable from discharge to 1-month follow-up. Paths *d* and *h* reflect the extent to which change in a variable from discharge to 1-month follow-up is associated with change in the same variable from 1-month follow-up to 6-month follow-up.

Paths *l*, *m*, *n*, and *o* are of particular interest, such that they reflect lagged effects. Path *l* estimates the extent to which changes in FA from admission to discharge are associated with changes in OCD symptom severity from discharge to 1-month follow-up, whereas path *m* estimates the extent to which changes in OCD symptom severity from admission to discharge are associated with changes in FA from discharge to 1-month follow-up. Path *o* estimates the extent to which changes in FA from discharge to 1-month follow-up are associated with changes in OCD symptom severity from 1-month to 6-month follow-up, and path *n* estimates the extent to which changes in OCD symptom severity from discharge to 1-month follow-up are associated with changes in FA from 1-month to 6-month follow-up.

Path *j* reflects whether change in OCD symptom severity from admission to discharge is associated with initial level of FA, and path *k* reflects whether change in FA from admission to

discharge is associated with initial level of OCD symptom severity. The path coefficients of the model for paths *b* through *o* are shown in Table 2.

Table 2.
Unstandardized and Standardized Path Coefficients for Key Paths in Figure 1

Path	Path coefficient
<i>b</i>	.508 (.596)**
<i>c</i>	.794 (.835)**
<i>d</i>	.832 (.697)**
<i>e</i>	.036 (.038)
<i>f</i>	.085 (.129)
<i>g</i>	.250 (.338)*
<i>h</i>	.814 (.613)**
<i>i</i>	.046 (.071)
<i>j</i>	-.067 (-.084)
<i>k</i>	.007 (.010)
<i>l</i>	.012 (.010)
<i>m</i>	.155 (.253)*
<i>n</i>	.417 (.225)**
<i>o</i>	.104 (.121)

Note. Standardized coefficient shown in parentheses. Path letters refer to paths in Figure 1.

* $p < .05$

** $p < .01$

Examination of stability coefficients revealed significant stability effects for OCD symptom severity from admission to discharge (path *b*); however, the stability coefficient from admission to 6-month follow-up (path *e*) failed to reach significance. There were no significant stability effects for FA from admission to discharge (path *f*) or from admission to 6-month follow-up (path *i*). Paths *c* and *d* were significant, such that those with greater changes in OCD symptom severity from admission to discharge were most likely to show greater changes in OCD

symptom severity from discharge to 1-month follow-up, and those with greater changes in OCD symptom severity from discharge to 1-month follow-up were most likely to show greater changes in OCD symptom severity from 1- to 6-month follow-up. Similarly, paths *g* and *h* were significant, such that those with greater changes in FA from admission to discharge were most likely to show greater changes in FA from discharge to 1-month follow-up, and those with greater changes from discharge to 1-month follow-up were most likely to show greater changes in FA from 1- to 6-month follow-up. Change in OCD symptom severity between admission and discharge was not significantly associated with initial levels of FA (path *j*) and change in FA between admission and discharge was not significantly associated with initial levels of OCD symptom severity (path *k*).

Path *m* was significant, such that changes in OCD symptom severity from admission to discharge predicted changes in FA from discharge to 1-month follow-up, whereas path *l*, representing the lagged effect from FA to OCD symptom severity, was not significant. Path *o* was significant, such that changes in FA between discharge and 1-month follow-up predicted changes in OCD symptom severity between 1-month follow-up and 6-month follow-up, whereas path *n*, representing the lagged effect from OCD symptom severity to FA, was not significant.

CHAPTER 4

DISCUSSION

This study, the first to investigate temporal relationships between FA and OCD symptom severity during and after intensive/residential treatment, suggested a lagged effect linking increases in FA in the month following discharge to increases in symptom severity between 1- and 6-month follow-up. By contrast, treatment-related decreases in symptom severity from admission to discharge appeared to drive change in FA in the month following discharge. FA was common at admission, with female patients reporting significantly greater FA than did male patients. FA was positively associated with OCD symptom severity and predicted by multiple symptom dimensions (when accounting for the effects of others): contamination, responsibility for harm, and symmetry/incompleteness.

The lagged effect of change in OCD symptom severity (during treatment) on change in FA between discharge and 1-month follow-up suggests that FA may be reduced in the early follow-up period as a consequence of treatment-related reductions in OCD symptom severity. Because the study was naturalistic and treatment didn't follow a standard protocol, the extent to which FA was targeted in IRT is unclear; it's possible that a lagged effect in the reverse direction would have also been significant (suggesting bidirectional influences) had the focus on FA been more intense. Indeed, in a study of outpatient exposure-based CBT plus a structured family intervention for youth with OCD, reduced accommodation preceded reduced symptom severity and functional impairment (Piacentini et al., 2011).

Interestingly, there was a lagged effect linking increases in FA between discharge and 1-month follow-up with increases in OCD symptom severity between 1- and 6-month follow-up while the path representing the lagged effect in the reverse direction was not significant. This

finding suggests that following discharge from treatment, increases in FA in the home environment may precede future increases in OCD symptom severity, rather than vice versa. O'Connor and colleagues (2021) found a similar pattern of results among youth with OCD, such that FA did not predict symptom severity at subsequent time points during the first half of treatment, yet at week 9, FA predicted subsequent symptom severity at post-treatment (rather than vice-versa). These results have clinical implications, as they suggest that increased FA at follow-up may attenuate long-term treatment gains. Although the mean increases in FA and OCD were relatively small, possibly because outpatient CBT with ERP is routinely recommended upon discharge, they may reflect a trend that could ultimately result in the need to return to IRT. Intensifying the focus on FA as individuals transition home, perhaps via videoconferencing sessions or consultation with outpatient providers, may optimize treatment effectiveness and promote the maintenance of gains.

Results demonstrate that FA is common among families of adults presenting for IRT; 93% reported at least some accommodation and 24% of participants reported daily accommodation. The frequency of FA did not differ by relationship type of the accommodating family member or marital status. FA differed by gender, such that females, on average, reported significantly higher FA at admission than did male participants. The only other study that examined FA in adults receiving IRT did not find a gender difference (Stewart et al., 2008), possibly because the FAS was administered to family members rather than to patients (as in the present study). Future research should test the possibility that males are more likely than females to underreport FA relative to family members.

Consistent with previous research (e.g., Ferraro et al., 2006; Garcia et al., 2010), FA was positively correlated with OCD symptom severity. Additionally, multiple OCD symptom

dimensions predicted unique variance in FA: contamination, responsibility for harm, and symmetry/incompleteness symptoms. There was no significant relationship between FA and unacceptable thoughts. The unacceptable thoughts dimension is characterized by the experience of unwanted and intrusive obsessions, often of a religious, violent, or sexual nature. There is often a lack of *observable* compulsive behaviors accompanying these obsessions, such that individuals tend to engage in mental or more covert ritualizing behavior (e.g., praying, mental review; Williams et al., 2011). Additionally, individuals with high levels of unacceptable thoughts are particularly likely to experience shame and stigma (Glazier et al., 2015). Thus, individuals with relatively severe unacceptable thoughts may be less likely to solicit accommodation from family members.

Study limitations warrant consideration. First, there were no incentives to participate in the study and follow-up data were available for only 35% of patients admitted consecutively to the IRT program. However, there were no significant differences in baseline variables between those for whom follow-up data were and were not available, and missing data were found to be missing completely at random. Whereas high levels of attrition are particularly concerning in the context of treatment effectiveness studies because participants may be more likely to drop out if their symptoms are not improving, the current study investigated temporal relationships between treatment-relevant variables rather than treatment outcomes. Nonetheless, replication would strengthen the current findings. Second, due to the naturalistic design of the study, the length of treatment varied and presumably, most patients were discharged because they evidenced sufficient reduction in OCD symptom severity. This may have led to less variability in OCD severity at discharge than would be found following a standardized course of treatment. Additionally, family involvement in treatment was not standardized and the extent to which FA

accommodation was targeted is unknown. Beyond following up with families after discharge to support patients in the transition back to the home environment, it is not possible to suggest ways that the focus on FA during treatment can be intensified.

Future research may aim to refine the assessment of change in FA in IRT; frequency of accommodating behaviors may not be the best indicator of shifting responses to the patient's OCD when contact with family members is limited. It may be useful to assess family members' beliefs about accommodating behaviors and their reasons for accommodating. Additionally, while the FAS-PV has been shown to demonstrate sound psychometric properties and a strong positive relationship with the family-report version (Wu et al., 2016), may consider the use of observational measure of FA compared to the FAS-PV to determine validity. Finally, future studies should also consider the possibility that patients live with multiple relatives who may accommodate OCD symptoms and test for cumulative effects.

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