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Suicide and Life-Threatening BEHAVIOR

ORIGINAL ARTICLE

Suicide decision-making: Differences in proximal considerations between individuals who aborted and attempted suicide

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Abstract

Introduction: The transition from suicidal thoughts to behaviors often involves considering the consequences of suicide as part of the decision-making process. This study explored the relationship between this consideration process and the decision to either abort or carry out a suicide attempt.

Methods: Among inpatients with a suicide-related event in the past 2 weeks (suicide attempt $n = 30$ or aborted attempt $n = 16$), we assessed the degree to which they considered six domains of consequences, the impact of these considerations on their inclination to attempt suicide, and the duration of their decision-making.

Results: All the participants who aborted and 87% of those who attempted considered consequences of suicide. Participants who aborted took longer to progress through decision-making stages and considered more suicide-hindering factors, especially interpersonal ones, though these differences were no longer significant after correction. Group status moderated the relationship between the balance of suicide-facilitating and suicide-hindering considerations and decision-making duration. Considering the consequences of suicide more favorably was related to a shorter ideation-to-action period before a suicide attempt and a longer ideation period before aborting an attempt.

Conclusion: This study highlights the complexity of suicide decision-making and its role in better understanding the progression from ideation to action.

KEYWORDS

ideation-to-action, proximal risk and protective factors, suicide decision-making

INTRODUCTION

Suicide is among the leading causes of death worldwide (World Health Organization, 2021); yet our understanding of the critical period preceding a suicide attempt remains limited. Numerous accounts suggest that in a suicide crisis, people's ability to reason and make a "rational" decision is limited (e.g., Baumeister, 1990;

Wenzel & Beck, 2008). On the other hand, the decision to end one's life is undeniably one of the most profound choices a person can make. Given the gravity of this decision and the inherent cognitive limitations during a suicide crisis, the process through which individuals arrive at the choice of suicide may involve a mixture of conflicting thoughts and emotions. When wanting to die during a suicide crisis, individuals often simultaneously experience wishes to live (Bergmans et al., 2017; Fartacek et al., 2024; Galasiński & Ziółkowska, 2024; Kovacs & Beck, 1977; Oakey-Frost et al., 2023; O'Connor et al., 2012; Shneidman, 1996). The ambivalence about life and death could precipitate an internal debate during which people may weigh (consciously, unconsciously, or both) the pros and cons of suicide and compare it with other alternatives to achieve their desired outcome (i.e., the termination of distressing emotions; Dombrovski & Hallquist, 2017; Harris et al., 2010; Mrozynski & Kuhn, 2022). Understanding this decision-making process is crucial for developing effective suicide prevention strategies. In this study, we took a first step in this direction by describing one central aspect of decision-making: How individuals consider the consequences of attempting suicide in the period leading up to engaging in suicidal behavior.

A main focus of prior research in this area has been to understand *how much* people plan and consider the consequences of suicide before attempting (Anestis et al., 2014). However, many studies use the amount of time people spend "thinking about" and "planning" a suicide attempt as a *proxy* for how much people consider the consequences of suicide (see Anestis et al., 2014 and Chalker et al., 2015 for reviews). There are several limitations to this approach. First, assessing "thinking about" and "planning" conflates considering the consequences of suicide with thinking through the logistics (i.e., method, place, and time) of attempting suicide. For example, a person could focus on securing means to attempt suicide for an hour, with little thought about the future ramifications of attempting suicide. Second, even if a person did spend the hour considering the consequences of suicide, the length of time does not provide adequate information on *how* such thoughts influence their decision. In other words, the same consequence may influence peoples' decisions differently based on how they perceive it. For example, one person may perceive their family's sadness over their death as revenge (i.e., facilitates suicide), whereas another person may feel guilty and want to avoid causing their family sadness (i.e., hinders suicide). Therefore, evaluating whether a consequence facilitates or hinders suicide is essential for comprehending its impact on decision-making. Recognizing the role of suicide-facilitating versus-hindering consequences can inform effective suicide prevention.

The Reasons for Living versus Reasons for Dying (RFL/RFD) Assessment (Jobes & Mann, 1999) has been used in studies to measure life-or death-oriented beliefs and expectations (Linehan et al., 1983). RFL measures suicide-hindering consequences (e.g., hurting loved ones), while RFD measures suicide-facilitating consequences (e.g., escaping current distress). Studies have found that a higher score on RFD is associated with a subsequent suicide attempt (Brüdern et al., 2018; Gysin-Maillart et al., 2022), while a higher score on RFL is linked to a lower suicide intent (Flowers et al., 2014; Strosahl et al., 1992), lower likelihood of having a history of suicide attempt (Christensen et al., 2020), lower risk for future attempt (Bryan et al., 2018), and suicide death (Brown, Steer, et al., 2005; Flowers et al., 2014; Lizardi et al., 2007). These findings suggest that considering the consequences of suicide indeed affects suicide risk. The RFL/RFD Assessment was designed to assess *current* risk, and no studies have specifically examined RFL/RFD in the period just prior to attempting. RFL/RFD scores in the context when individuals are reflecting on a specific and recent suicide crisis may provide new insights on how the consideration of future consequences affects their decisions at the time.

Previous studies using the RFL/RFD Assessment found that some consequences were listed both as RFL and RFD, indicating that they could be both facilitators and barriers to suicide (Fox et al., 2021; Jobes & Mann, 1999). However, given that the RFL/RFD Assessment only asks people to list up to five RFL and RFD in the order of importance, it does not capture the *degree* to which individuals think about or prioritize each reason. Even if two people list the same reason as the most important RFL, one may consider or weigh it more than the other. One study that tried to examine the relative extent of RFL and RFD found that having a greater number of RFD relative to RFL was associated with a history of multiple suicide attempts (Fox et al., 2021), indicating that the relative degree of suicide-facilitating versus -hindering consideration may be associated with suicidal behavior. Though comparing the number of items listed as RFL/RFD provides preliminary knowledge on the relative degree, it still does not capture the full degree. When two individuals both list only one RFL, one may barely consider it, whereas the other may consider it extensively.

Thinking about the unfavorable consequences of suicide has been commonly used as a suicide prevention strategy in clinical settings. Clinicians often prompt suicidal patients to identify and build reasons for living (Britton et al., 2012; Brown, Ten Have, et al., 2005; Linehan et al., 2006). When people experience suicidal

thoughts, they may be hyper-focused on how suicide is their ultimate solution, so such prompts may facilitate more considerations of the unfavorable consequences of suicide. One unevaluated assumption of this prevention strategy is that after considering the unfavorable consequences of suicide more extensively at the moment, people are more likely to stop their path to attempt. To test this assumption on decision-making during crisis, this study examined whether the degree of suicide-facilitating and suicide-hindering consideration is associated with aborting (Barber et al., 1998) versus carrying out a suicide attempt.

Previous research showed that thinking about the consequences of suicide is linked to suicide risk, but we do not fully understand how such considerations relate to the decision to attempt suicide in the moments leading up to it. To address this gap, we interviewed individuals who had attempted suicide and individuals who had aborted their suicide attempts recently about how they thought about the consequences of suicide before attempting or aborting. We assessed the degree to which individuals considered six domains of consequences and whether the consequences facilitated, hindered, both, or had no effect on their decision to attempt. We also inquired how long it took to make the decision and examined whether considerations were associated with a longer decision-making process. To understand how considering consequences may be related to reconsidering suicide and stopping an attempt, we compared the responses of those who attempted suicide to those who considered it and started to take initial steps toward attempting, but ultimately decided not to attempt (i.e., engaged in an aborted attempt).

METHODS

Participants

Participants were 46 adults admitted to an inpatient psychiatric hospital, divided into two groups based on actions taken within the 2 weeks prior to admission. This time frame was specifically chosen to minimize the effects of recall bias and memory loss. The attempted group ($n = 30$) made a suicide attempt in the 2 weeks prior to admission. They answered yes to "Have you ever tried to kill yourself, meaning you engaged in a potentially deadly behavior to end your life with some intention of dying?" and identified the most recent attempt occurring within the past 2 weeks. The aborted group ($n = 16$) aborted a suicide attempt also in the 2 weeks prior. They answered yes to "Have you ever started to take steps to kill yourself and at the last minute you stopped because you decided not to kill yourself?" and identified the most recent aborted attempt occurring within the past 2 weeks. Exclusion criteria for both groups included past or current psychotic symptoms or cognitive impairment that would prevent understanding informed consent. Participants were required to correctly answer three questions about the informed consent form to ensure they understood the nature of the study.

Demographic information is shown in Table 1 for the two study groups: (1) individuals who had attempted suicide in the past 2 weeks, and (2) individuals who had recently made an aborted suicide attempt in that same time frame. Most participants in both groups were young White adults who had completed high school and, in many cases, had attended some college. The two groups

TABLE 1 Demographics and history of self-injurious behaviors.

	Aborted $n = 16$	Attempted $n = 30$	p
Age, *M* (SD)	24.81 (7.15)	26.77 (8.93)	0.42
Sex, % (*n*)			
Female	75% (12)	60% (18)	0.31
Male	25% (4)	40% (12)	
Race, % (*n*)			
African American	0% (0)	3.3% (1)	0.99
Asian	6.7% (1)	10% (3)	
White	86.7% (13)	83.3% (25)	
Mixed	6.7% (1)	3.3% (1)	
Education, % (*n*)			
Less than high school	0% (0)	6.9% (2)	0.86
High school graduate	0% (0)	6.9% (2)	
Some college	56.3% (9)	44.8% (13)	
College graduate	31.3% (5)	27.6% (8)	
Professional degree	12.5% (2)	13.8% (4)	
Whether a student, % (*n*)			
Student	56% (9)	40% (12)	0.29
Not a student	44% (7)	60% (18)	
History of SIB			
Lifetime NSSI, % (*n*)	69% (11)	57% (17)	0.42
Past aborted attempt, % (*n*)	88% (14)	63% (19)	0.10
Number of aborted attempts, *M* (SD)	5.28 (11.94)	2.10 (3.73)	0.31
Past attempt, % (*n*)	0 (0)	47% (14)	<0.001***
Number of attempts, *M* (SD)	0 (0)	2.58 (6.82)	0.047*

Abbreviations: NSSI, non-suicidal self-injury; SIB, self-injurious behaviors.
*$p < 0.05$; *** $p < 0.001$.

did not significantly differ in any assessed demographic characteristics.

Procedure

After giving informed consent, participants completed demographic assessments and were interviewed about their history of suicidal thoughts and behaviors as well as details about their most recent suicidal behavior (see Millner et al., 2017). Participants also completed four behavioral measures not included in this study (see Millner et al., 2020 for results of the behavioral measures). Participants were compensated $25 plus a bonus amount based on elements of the behavioral tasks.

Measures

Pathway to suicidal action interview

The Pathway to suicidal action interview's (PSAI, Millner et al., 2017) introduction section comprehensively assesses the history of various suicidal thoughts and behaviors, including actions that classify participants into the attempted and aborted groups (see Participants section for the specific language). Based on the grouping from the PSAI introduction interview, the PSAI follow-up interview includes an in-depth assessment of the decision-making and planning process. For this study, we focused exclusively on the sections assessing the consideration of consequences and the length of time spent thinking about whether to attempt. See Millner et al. (2017) for the results of specific planning processes (e.g., selecting a method and a place to attempt suicide, and preparatory actions) and see https://osf.io/4wcxk/ for the PSAI instrument.

Consideration of the Consequences of Suicide. This section of the PSAI inquires about six broad domains that people commonly consider as consequences of suicide. Adapted from the Reasons for Living Inventory (Linehan et al., 1983), the six domains are: (1) what it means to die, (2) what happens after death, (3) family and friends, (4) others' reactions, (5) one's responsibilities, and (6) the pain, blood, and violence associated with suicide. For each domain, participants were asked "On a scale of 0-4 (with 0 indicating no consideration and 4 indicating very extensive consideration), how much did you consider [domain] when thinking about killing yourself in this recent attempt?" If participants answered more than 0 on a given domain, they were asked "Did thinking about [domain] made you (i) more inclined to attempt, (ii) less inclined to attempt, (iii) pushed you in both directions or (iv) pushed you in neither direction?"

Based on responses to the questions above, we derived four consideration variables. First, the total consideration score captured the overall degree of consideration, regardless of their influence on decision. It was determined by summing the ratings from 0 to 4 for each of the six domains assessed. Second, the suicide-facilitating consideration score captured the degree of consideration that made the individual more inclined to attempt. We calculated it by summing the ratings for each domain that heightened the individual's inclination for suicide. Third, the suicide-hindering consideration score captured the degree of consideration that made one less inclined to attempt suicide. Correspondingly, it was computed by summing ratings for considerations that lowered the individual's inclination for suicide. Fourth, we divided total consideration score by the suicide-facilitating consideration score to calculate the relative balance of the suicide-facilitating consideration and suicide-hindering consideration (SFC-SHC balance). A SFC-SHC balance larger than 50% would indicate the consideration process facilitated suicide or the individual found suicide as a more favorable option over living. We selected a proportion score to represent the relative balance over the more widely used subtraction-based metrics (e.g., an ambivalence score based on wish to die—wish to live subtraction, Fartacek et al., 2024; a subtraction-based RFD-RFL index, Fox et al., 2021). The proportion score more accurately reflects the relative degree in relation to the total degree. For instance, a subtraction score of 1 would be identical for someone scoring 0 and 1 as it would be for someone scoring 10 and 11, despite the substantial difference in the underlying degrees. In contrast, a proportion score would yield 0% and 48%, offering a more appropriate measure of the relative balance.

There were instances where participants reported that a domain made them both more *and* less inclined to attempt suicide. Such degrees of consideration were divided by two and added to the suicide-facilitating and-hindering consideration scores. In cases when participants reported considering a domain made them *neither* more nor less inclined to attempt suicide, the degree was added to the total consideration score and not to the suicide-facilitating or -hindering consideration score. As a result, suicide-facilitating and -hindering consideration scores do not always add up to the total consideration score. For participants who reported zero total consideration (attempted group: $n = 4$ out of 30; aborted group: $n = 0$), their suicide-facilitating and hindering consideration scores were entered as zero, and they were not included in summarizing the SFC-SHC balance.

Duration of Suicide Decision-Making. Three variables in the PSAI assess the length of time individuals spend in decision-making concerning the recent event. Data from this portion of the interview were used to determine

how much prior to attempting or aborting the recent attempt the participants (1) started to consider suicide, (2) started to mull over/strongly consider whether or not to attempt, and (3) decided to attempt suicide. We asked following questions to estimate these time points: (1) "Thinking about this (stopped) attempt, when did you first start thinking about suicide?" (2) "Thinking about this (stopped) attempt, when did you first start mulling or strongly considering killing yourself but were still not sure if you would actually try to do it? Perhaps going back and forth in your mind about whether you should do it?," and (3) "How much time passed between your decision to attempt and the (stopped) attempt?" if they decided to attempt. To precisely pinpoint when participants felt certain about their decision, they were asked "At the point when you decided to attempt, would you say you were leaning towards it, pretty sure or sure you were going to do it?" If participants responded that they were leaning toward or pretty sure, they were then asked "Was there a time before when you were *sure* you would attempt suicide?" The time they indicated as being sure was recorded as their decision time. We believe that individuals who attempt suicide ultimately make a decision, regardless of their level of certainty or their state of awareness at the time, including situations where they may have been under the influence or dissociated. As a result, for those who attempted but were never fully sure ($n=2$ out of 30), we recorded their decision time as the time they were "leaning towards" or "pretty sure" about attempting. For those who attempted but never experienced a moment when they were "leaning towards," "pretty sure," or "sure" ($n=4$ out of 30), we recorded their decision time as within 1 min prior to the attempt.

The PSAI allows individuals to report time freely, using time units that they find most comfortable, which introduces challenges in analysis and interpretation. As the length of time between two events increases, people tend to describe it using larger units and often omit the smaller units (e.g., 10 min instead of 10 min and 17 s; Huttenlocher et al., 1990). This response tendency results in an exponential pattern in time estimates (see Millner et al., 2017 for details). To achieve a linear pattern and enhance interpretability, we grouped the time estimates into bins that approximate a log-transformation of the original time data (e.g., bin 0 represents less than 1 min prior to attempt; bin 1 represents 1–5 min; see Table 2 for details). The bin numbers showed a near-perfect correlation with the log-transformed time data ($r=0.99$, $p<0.001$), confirming their suitability as the unit of time for analyses. It is important to note that not all participants progressed through every decision-making stage evaluated. For instance, some participants attempted suicide without any mulling ($n=12$ out of 30), and some in the aborted group never decided to attempt ($n=9$ out of 16). Figure 3 shows the number of participants who reporting each stage. Consequently, participants who did not undergo the relevant stages were excluded from group comparisons regarding the duration of the stage and from analyses exploring the relationship between duration and the degree of consideration.

Analytic plan

Analyses were conducted in R (R Core Team, 2023). We first compared the total, suicide-facilitating, and suicide-hindering consideration scores, and the duration of the three decision-making stages for the two groups. To control for false positive rates in a family of comparisons, or family-wise error rate (FWER), we also conducted a maximum statistic correction using permutations (Lindquist & Mejia, 2015; Nichols & Hayasaka, 2003). This method randomly assigns participants into two groups and performs the six family-wise comparisons to obtain the maximum t statistic. With 2000 permutations, we generated a distribution of the maximum statistic and determined the 95th percentile value as the corrected significance threshold. Compared to Bonferroni correction, the permutation method offers improved validity, especially for small samples (Lindquist & Mejia, 2015). The small sample size led to a maximum statistical power of 0.57, which may have limited our ability to detect smaller effect sizes. To mitigate this limitation, we calculated Hedges' g for effect sizes and emphasized effect sizes over p values. These adjusted effect sizes offer a meaningful measure

TABLE 2 Time intervals and the corresponding bin numbers.

Bin number	0	1	2	3	4	5	6	7	8
Interval	<1 min	1–5 min	6–15 min	16–30 min	0.5–1 h	1–2 h	2–3 h	3–6 h	6–12 h
Bin number	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
Interval	12–24 h	1–3 days	3–7 days	1–2 weeks	2–4 weeks	1–6 months	6–12 months	1–5 years	>5 years

Note: The purposes of grouping continuous time intervals into discrete bins are to (1) approximate the log-transformation of the original time data that achieves a linear pattern and (2) enhance interpretability and clinical utility.

for observed effects and provide a reliable foundation for guiding future research.

Since the SFC-SHC balance ranges between 0 and 1, we employed a beta regression model with the *betareg* package (Cribari-Neto & Zeileis, 2010) to explore the group differences and a permutation-based beta regression as a robustness check. Beta regression models are commonly used to model proportion values that are continuously distributed between 0 and 1. Given the presence of extreme values of 0 and 1, we further transformed the SFC-SHC balance using the recommended formula $(y \times (n-1)+0.5)/n$ (Smithson & Verkuilen, 2006). Following group comparisons, we conducted linear regressions to evaluate the relationships between the consideration variables and the duration variables, including group as an interaction term. Similarly, we controlled for FWER using maximum statistic correction with permutations. For transparency, we reported both uncorrected and corrected *p* values.

RESULTS

History of self-injurious behaviors

Among participants who made a suicide attempt in the past 2 weeks, 47% had also attempted suicide one or more times in the past (number of past attempts: $M = 2.58$, SD = 6.82), whereas none of the participants who made an aborted attempt in the past 2 weeks had a history of suicide attempts (see Table 1). A comparable proportion of participants in each group reported a history of non-suicidal self-injury (69% of aborted and 57% of attempted) and a history of aborted attempts (88% of aborted and 63% of attempted). The number of past aborted attempts did not differ between groups (aborted: $M = 5.28$, SD = 11.94; attempted: $M = 2.10$, SD = 3.73; $p = 0.31$).

Consideration during suicide decision-making

Do people consider the consequences of suicide, and if so, how much?

By defining the presence of consideration as having a nonzero total consideration score, we found that all participants who aborted their attempt considered the consequences of suicide, while 87% ($n = 26$ out of 30) of those who attempted suicide did so. The total degree of consideration (sum of consideration ratings in each of the six assessed domains) did not differ ($t[34.06] = 1.78$, $p = 0.08$, $g = 0.52$; see Table 3) between those that attempted suicide ($M = 7.83$, SD = 5.09) and those who aborted the attempt ($M = 10.44$, SD = 4.53). Given that the possible range of total degree of consideration was 0–24, both groups engaged in a modest degree of consideration (i.e., group averages did not reach the halfway point of the possible scales).

Is considering the consequences of suicide related to aborting versus attempting?

Although there were no statistically significant differences between the two groups in how they considered the consequences, the results revealed some interesting trends. As shown in Table 3, both groups considered suicide-facilitating consequences to a similar degree ($t[35.58] = 0.30$, uncorrected $p = 0.76$, corrected $p = 1$, $g = 0.09$). However, individuals who aborted their attempt tended to consider suicide-hindering consequences more intensely, with a medium effect size, though this difference was only marginally significant before correction ($t[28.02] = 2.01$, uncorrected $p = 0.053$, $g = 0.63$) and no longer significant after correction (corrected $p = 0.26$). The SFC-SHC balance did not significantly differ between groups, but there was a trend suggesting a higher proportion of suicide-facilitating considerations in those who attempted suicide, with a marginal effect of 0.11 (aborted: $M = 36\%$, SD = 24%; attempted: $M = 49\%$, SD = 28%; uncorrected $p = 0.12$, corrected $p = 0.21$). This suggests that individuals who attempted suicide had an 11% higher proportion of suicide-facilitating considerations than those who aborted their attempt. Additionally, 58% of those who attempted suicide and had considerations reported their suicide-facilitating considerations were equal to or outweighed suicide-hindering considerations, compared to 31.25% of those who aborted their attempt (see Figure 1).

When examining the relationship between specific considerations and the inclination to attempt, we found that both groups reported considering interpersonal consequences—family and friends, others' reactions to them attempting suicide, and their responsibilities—to the greatest extent (see Figure 2). For those who aborted their attempt, suicide-hindering interpersonal considerations clearly outweighed suicide-facilitating ones, whereas for those who attempted, these considerations were mostly balanced. Participants in both groups considered the meaning of death and what happens after death to a modest degree, with these domains more likely to facilitate than hinder suicide. Compared to those who attempted, those who aborted their attempt considered the pain,

TABLE 3 Group differences in the degree of consideration given to the consequences of suicide.

	Aborted[1] $n=16$	Attempted[1] $n=30$	Uncorrected p	Corrected p	Effect size
Total consideration	10.44 (4.53)	7.83 (5.09)	0.08[2]	0.39[4]	0.52[6]
Suicide-facilitating consideration	3.91 (2.90)	3.62 (3.44)	0.76[2]	1[4]	0.09[6]
Suicide-hindering consideration	4.97 (3.73)	2.72 (3.36)	0.053[2]	0.26[4]	0.63[6]
SFC-SHC balance	36% (24%)	49% (28%)	0.12[3]	0.21[5]	0.11[7]

Note: [1]*M* (SD). [2]Independent samples *t*-test. [3]Beta regression. [4]Permutation-based *p* value for *t*-test. [5]Permutation-based *p* value for beta regression. [6]Hedges' *g*. [7]Marginal effect. The total consideration score is different from adding suicide-facilitating and -hindering consideration scores. In cases where considering a consequence reportedly made an individual feel *both* more and less inclined to attempt, the degree of consideration for that consequence was divided by 2 and the divided values were added to both the suicide-facilitating and -hindering consideration scores. In cases where considering a consequence reportedly made an individual *neither* more nor less inclined to attempt, the degree of consideration for that consequence was added once to the total consideration score and *not* added to either the suicide-facilitating or the-hindering consideration score. The four participants in the attempted group who did not have any considerations were excluded from analyses of the SFC-SHC balance.

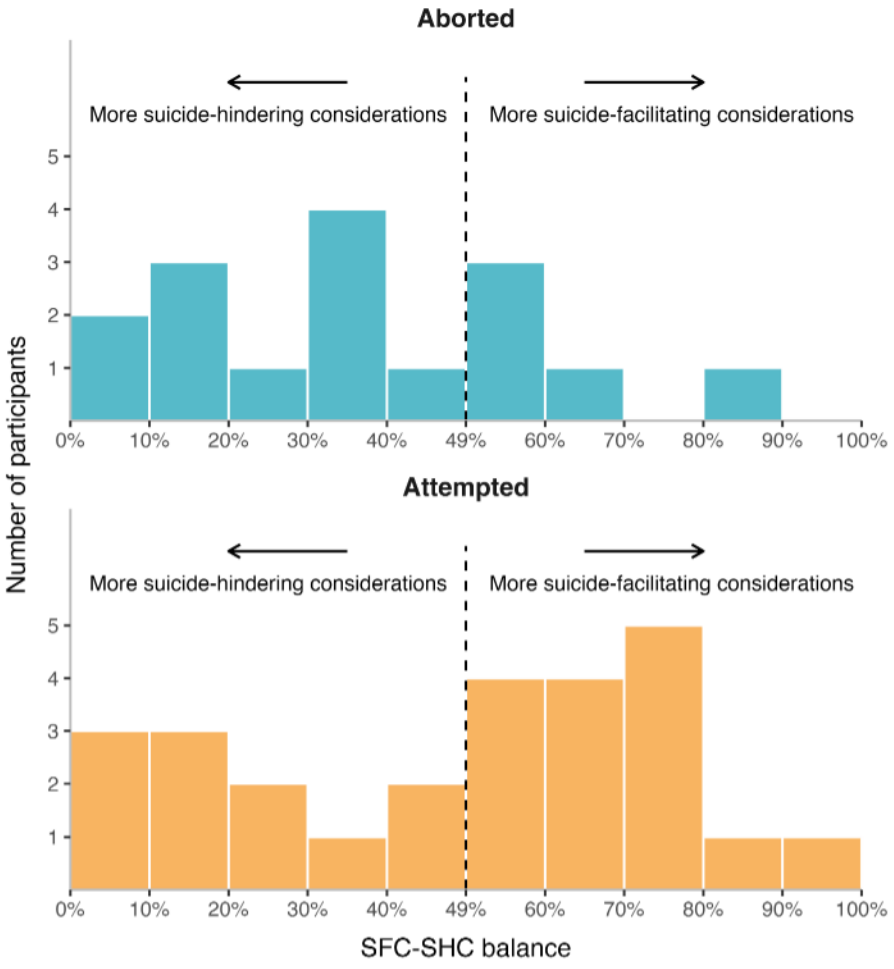

FIGURE 1 Distribution of balance between suicide-facilitating and suicide-hindering considerations. SFC-SHC balance reflects the percentage of the total consideration that strengthened the individual's inclination to attempt suicide. A SFC-SHC balance larger than 50% indicates the consideration process makes the individual more inclined to attempt.

blood, and violence of suicide to a greater (but still modest) degree, viewing them more as a reason not to attempt.

Are mulling and consideration related to the certainty of decision?

Among the 30 participants who attempted, 60% ($n=18$) reported mulling, 87% ($n=26$) reported considerations, and 80% ($n=24$) reported feeling certain about their decision to attempt. Of the 12 who denied mulling and attempted, three reported having no considerations at all, while the remaining nine reported considerations comparable to attempters who reported mulling ($M=8.22$, SD=4.32; $t[14.26]=0.38$, $p=0.71$). Of the six who were never certain about their intention to attempt but attempted, two denied consideration and mulling, one reported consideration but denied mulling, and the remaining three reported both consideration and mulling. Among the 16 participants who aborted, all reported considerations, 12 reported mulling, and seven

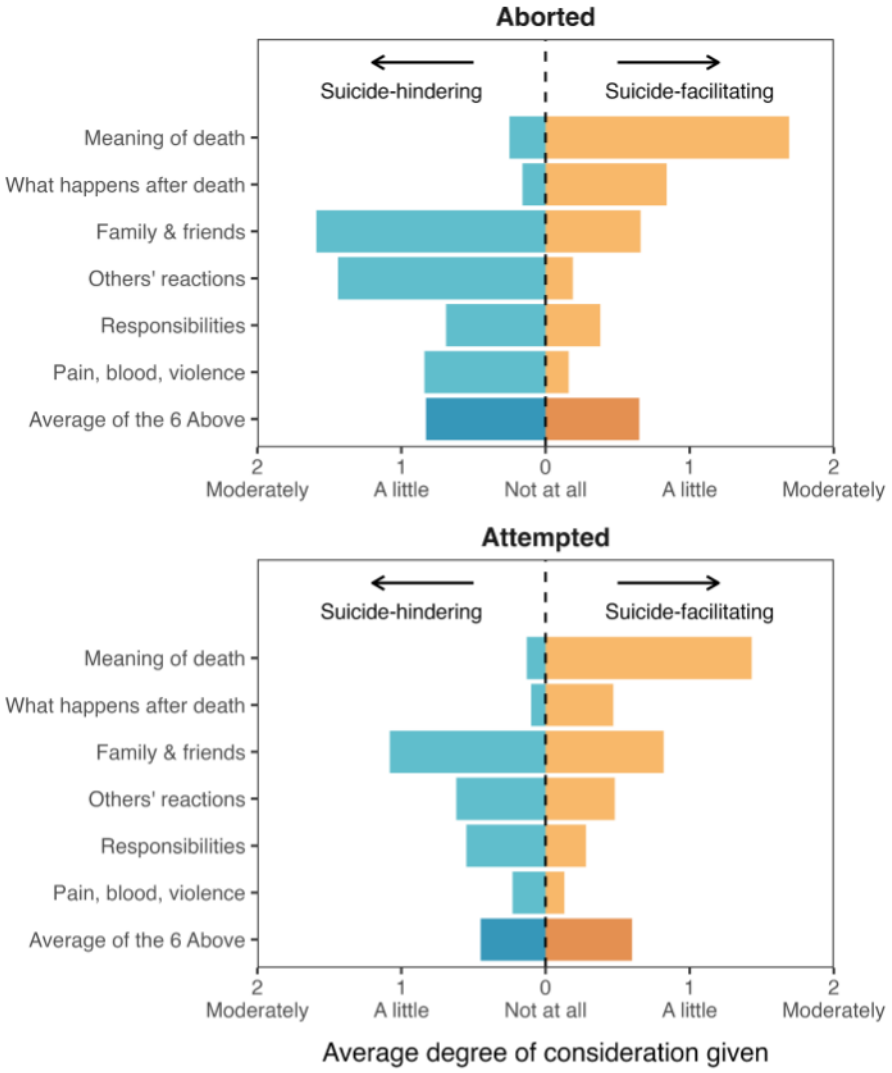

FIGURE 2 The degree of consideration given to each consequence of suicide, aggregated by the direction of impact on decision. The bottom bars for each group represent the average degree of consideration given to the six domains that facilitated and hindered the attempt, respectively. Averages exclude instances where participants indicated that a consequence made them neither more nor less inclined to attempt suicide. The possible range of degrees is 0–4 in both directions.

initially decided to attempt. Out of those seven, five denied mulling before ultimately aborting. The timescale of decision-making for participants who reported or denied mulling is presented in Figure 3.

Suicide decision-making duration

Is decision-making duration related to aborting versus attempting?

Figure 3 illustrates each individual's decision-making timeline and the median time for each stage. Compared to those who attempted, participants who aborted their attempt generally waited longer after the onset of ideation ($t[42.15]=2.07$, uncorrected $p=0.045$, $g=0.55$) and after the onset of mulling ($t[26.72]=2.09$, uncorrected $p=0.046$, $g=0.73$). However, these differences were no longer significant after correction (corrected $p=0.24$ and 0.23, respectively). Although the group difference in the duration between deciding to attempt and the end of the episode did not reach statistical significance ($t[7.43]=1.63$, uncorrected $p=0.14$, corrected $p=0.46$), it yielded a large effect size ($g=0.84$).

Consideration and duration

Is decision-making duration related to the degree of consideration?

When examining the relationship between decision-making duration and consideration scores without accounting for group status, we found no significant correlations. However, when group status was included as an interaction term, significant interaction effects emerged. Specifically, group status moderated the relationship between suicide-facilitating consideration score and the duration of mulling (uncorrected $p=0.018$, corrected $p=0.039$, $\eta_p^2=0.20$), as well as between the SFC-SHC balance and the duration of all decision-making processes, yielding large effect sizes (uncorrected $p=0.006$–0.041,

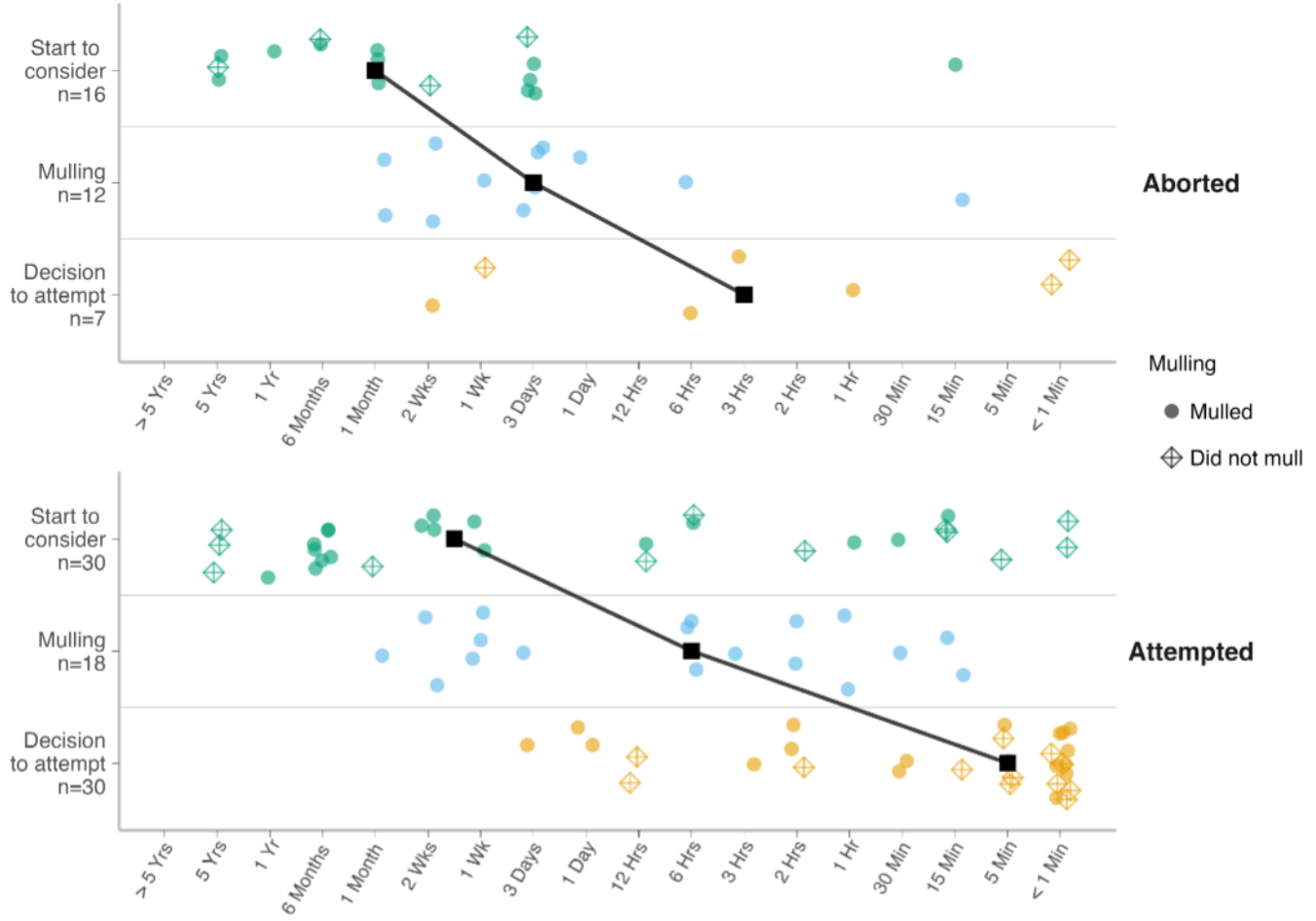

FIGURE 3 Suicide decision-making timeline. The *x*-axis is not drawn to scale. Dots and diamond shapes represent individual participants' reported times for the corresponding stages. Squares indicate the median time points for each stage within each group. The rightmost end point for those who aborted represents the moment they were very close to attempting but ultimately decided not to. The *n* varies across stages for both groups, as some who attempted denied mulling, and those who aborted their attempts stopped at different stages along the pathway (see *y*-axis for the *n* at each stage).

corrected $p = 0.008–0.07$, $\eta_p^2 = 0.14–0.23$; see Table 4; Cohen, 1969). A higher suicide-facilitating consideration score was linked to a longer mulling process before aborting an attempt, and a shorter mulling process before attempting (see Figure 4). Similarly, the SFC-SHC balance was positively correlated with the duration of the entire decision-making process (thinking, mulling, and deciding) for those who aborted their attempt, and negatively correlated with the decision-making duration for those who attempted. This suggests that considerations favoring suicide were associated with slower decision-making in those who aborted their attempt and faster decision-making in those who attempted.

DISCUSSION

There is little research focused on the decision-making process in the moments prior to a suicide attempt. Decisions may be influenced by the degree to which an individual considers the future consequences of their actions and whether those consequences are perceived to be beneficial or detrimental in the long run (Strathman et al., 1994). However, how people in a suicide crisis consider such consequences is unclear. In this study, we described how considering the consequences of suicide may play a role in individuals' decision to attempt suicide or to stop themselves right before attempting (i.e., abort the attempt). This study also provides new insight into how considerations relate to the timescale during which individuals transition from thinking about suicide to attempting or stopping suicide.

There were five main findings from this study. First, individuals who aborted their attempt and individuals who attempted suicide did not differ in the overall degree of consideration. Second, compared to those who aborted, those who attempted suicide were more likely to consider the consequences of suicide favorably, though

TABLE 4 Model results examining group as a moderator on the relationship between various consideration and duration variables.

	Model results						
Model description	***B***	***SE***	***β***	**Uncorrected *p***	**Corrected *p***	**η_p^2**	**95% CI**
Model 1: Total consideration							
Start to consider	0.22	0.36	0.22	0.54	0.64	0.02	−0.51, 0.96
Group	−1.07	4.92	−0.10	0.83	0.85	0.04	−11.00, 8.85
Consider × Group	−0.10	0.40	−0.12	0.81	0.83	0.00	−0.90, 0.71
Model 2: Total consideration							
Mulling	0.53	0.46	0.42	0.26	0.24	0.00	−0.41, 1.47
Group	6.28	5.33	0.68	0.25	0.35	0.02	−4.67, 17.23
Mulling × Group	−0.84	0.55	−0.84	0.14	0.21	0.08	−1.96, 0.29
Model 3: Total consideration							
Decision	0.06	0.44	0.04	0.90	0.93	0.05	−0.83, 0.95
Group	−4.31	3.39	−0.32	0.21	0.27	0.04	−11.20, 2.58
Decision × Group	0.34	0.52	0.21	0.52	0.54	0.01	−0.72, 1.41
Model 4: Suicide-facilitating consideration							
Start to consider	0.39	0.24	0.61	0.10	0.08	0.01	−0.08, 0.87
Group	4.73	3.20	0.71	0.15	0.22	0.00	−1.73, 11.19
Consider × Group	−0.42	0.26	−0.82	0.11	0.15	0.06	−0.95, 0.10
Model 5: Suicide-facilitating consideration							
Mulling	0.52	0.30	0.59	0.09	0.11	0.02	−0.09, 1.14
Group	8.51	3.47	1.33	0.021*	0.07	0.00	1.37, 15.65
Mulling × Group	−0.90	0.36	−1.31	0.018*	0.039*	0.20	−1.64, −0.17
Model 6: Suicide-facilitating consideration							
Decision	0.44	0.28	0.50	0.13	0.10	0.00	−0.14, 1.01
Group	2.33	2.19	0.28	0.30	0.32	0.00	−2.13, 6.79
Decision × Group	−0.58	0.34	−0.55	0.10	0.14	0.08	−1.27, 0.11
Model 7: Suicide-hindering consideration							
Start to consider	−0.19	0.26	−0.26	0.47	0.31	0.00	−0.71, 0.33
Group	−4.77	3.51	−0.64	0.18	0.11	0.09	−11.86, 2.32
Consider × Group	0.21	0.29	0.37	0.46	0.36	0.01	−0.36, 0.79
Model 8: Suicide-hindering consideration							
Mulling	−0.04	0.36	−0.04	0.91	0.89	0.01	−0.78, 0.69
Group	−1.24	4.15	−0.18	0.77	0.78	0.07	−9.77, 7.29
Mulling × Group	−0.09	0.43	−0.12	0.84	0.83	0.00	−0.97, 0.79
Model 9: Suicide-hindering consideration							
Decision	−0.18	0.31	−0.18	0.56	0.66	0.02	−0.80, 0.44
Group	−4.94	2.37	−0.52	0.045*	0.050	0.08	−9.76, −0.11
Decision × Group	0.47	0.37	0.40	0.20	0.30	0.05	−0.27, 1.22
Model 10: SFC-SHC balance							
Start to consider	0.04	0.02	0.65	0.042*	0.052	0.00	0.00, 0.08
Group	0.74	0.26	1.36	0.007**	0.048*	0.06	0.22, 1.26
Consider × Group	−0.05	0.02	−1.26	0.016*	0.06	0.14	−0.09, −0.01
Model 11: SFC-SHC balance							
Mulling	0.04	0.02	0.55	0.09	0.08	0.00	−0.01, 0.09
Group	0.72	0.27	1.44	0.013*	0.028*	0.13	0.16, 1.28

(Continues)

TABLE 4 (Continued)

Model description	Model results						
	B	*SE*	*β*	Uncorrected *p*	Corrected *p*	η_p^2	95% CI
Mulling × Group	−0.06	0.03	−1.12	0.041*	0.07	0.16	−0.12, 0.00
Model 12: SFC-SHC balance							
Decision	0.03	0.02	0.47	0.11	0.23	0.07	−0.01, 0.07
Group	0.43	0.16	0.66	0.012*	0.012*	0.02	0.10, 0.76
Decision × Group	−0.07	0.02	−0.88	0.006**	0.008**	0.23	−0.12, −0.02

Note: *B* = unstandardized coefficient; *SE* = (unstandardized) standard error; *β* = standardized coefficient; Corrected *p* = permutation-based *p* value; 95% CI = confidence interval of unstandardized coefficient. Time variables (start to consider, mulling, and decision) were entered as bin numbers.

*$p < 0.05$; **$p < 0.01$.

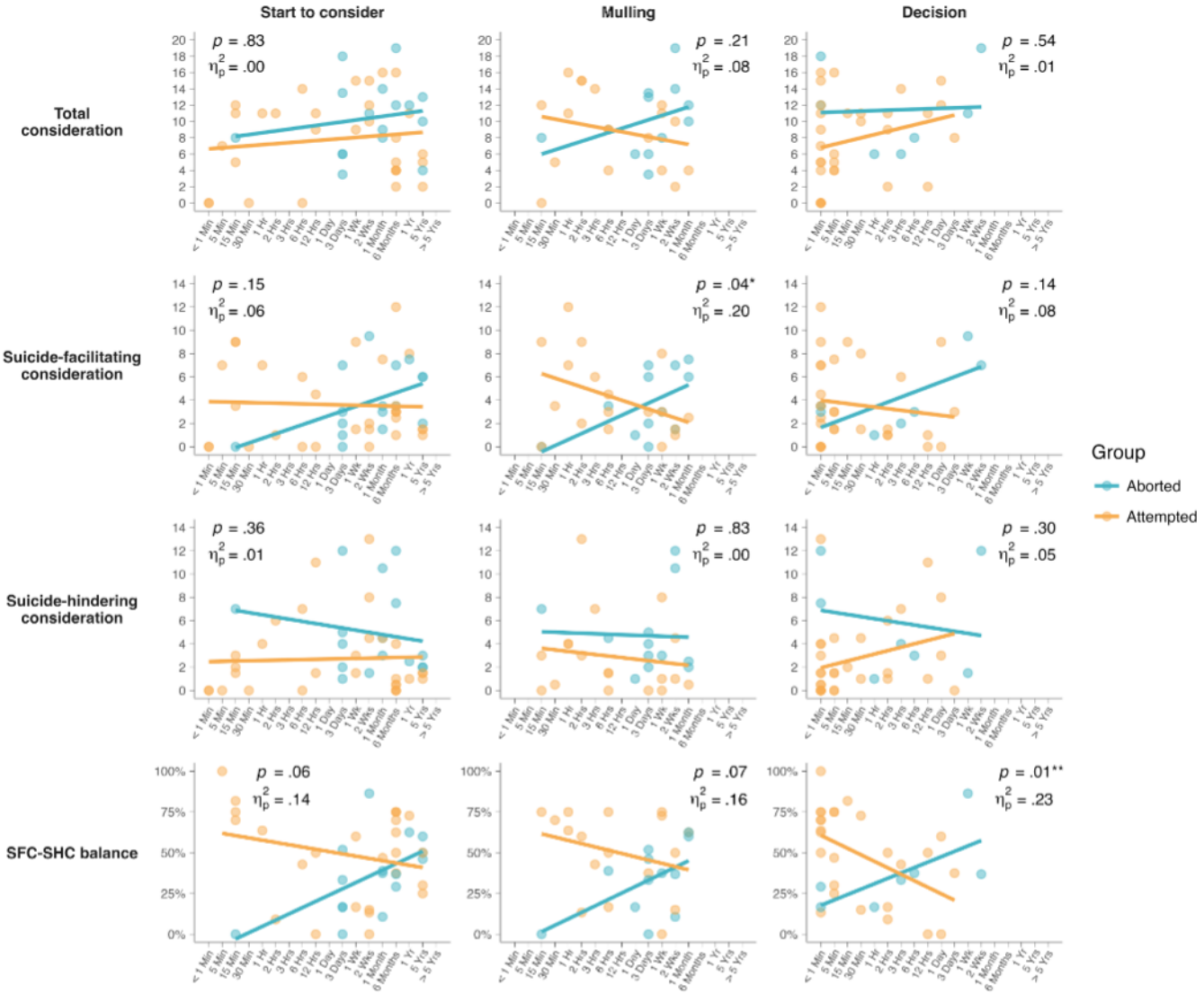

FIGURE 4 Moderation effects of group on the relationship between various consideration and duration variables. *p* = permutation-based (corrected) *p* value, η_p^2 = effect size of the interaction effect. Duration variables (start to consider, mulling, and decision) were entered as bin numbers. *$p < 0.05$; **$p < 0.01$.

this difference was no longer significant after correction. Third, the largest difference between groups was how they thought of interpersonal consequences; those who aborted their attempt saw these as reasons not to proceed with suicide, whereas those who attempted regarded them as equally compelling reasons both for and against

suicide. Fourth, the decision-making process was shorter for individuals who attempted suicide compared to those who aborted in the initial analyses, while the differences were not significant after correction. Lastly, a stronger focus on the perceived positives of suicide, relative to the negatives, was associated with a longer decision-making period before aborting the attempt, but a shorter period before proceeding with an attempt. Each finding warrants further discussion.

Prior research suggested that individuals who attempt suicide may not take into account the consequences of their actions (e.g., Britton et al., 2011). However, our findings showed that 87% participants who attempted suicide and 100% of those who aborted their attempt did, in fact, consider the consequences of suicide. This aligns with recent qualitative studies that explored these considerations in detail (Galasiński & Ziółkowska, 2024; Mrozynski & Kuhn, 2022). Both groups considered the consequences to a similar degree, indicating that the overall amount of consideration was not directly related to the final decision to attempt or abort. This suggests the mere quantity of consideration, or degree of contemplation, may not be a useful indicator of the ultimate behavior. It is worth noting that participants in both groups considered consequences to a modest to moderate degree. Thus, while they thought about the consequences, none of the consequences were considered to a large degree.

The second finding suggested a trend where individuals who attempted suicide considered suicide-hindering consequences to a lesser degree, compared to individuals who aborted suicide, though this difference was only marginally significant and did not remain significant after correction. Despite the lack of significance, the medium effect size suggests that a larger sample might provide more robust evidence of this effect. This result aligns with previous research demonstrating that a higher ratio of RFD to RFL is linked to a history of suicide attempts among inpatients with a recent suicide crisis (Fox et al., 2021). It emphasizes that *how* individuals consider the consequences may be related to their decision about whether to attempt suicide.

In this study, about half (46%) of the attempted group had more suicide-facilitating than suicide-hindering considerations, 12% had an equal balance, and 42% had more suicide-hindering considerations. In comparison, 25% of the aborted group had more suicide-facilitating considerations, 6% had an equal balance, and 69% had more suicide-hindering considerations. Therefore, while the majority of participants' decisions aligned with the net balance of their considerations, this alone did not determine the final behavioral outcome. Nonetheless, the evident differences in the extent of directional consideration could be instrumental in risk assessment and targeted intervention. The field has faced challenges in identifying distinctions between ideators and attempters, and evaluating proximal considerations could offer a promising area for investigation. Future studies with larger samples could explore the sensitivity and specificity in using the relative degree of consideration to predict suicidal behavior.

Our third key finding highlighted that disparities in the degree of suicide-hindering considerations between the groups were primarily driven by their interpretations of the interpersonal consequences and the capability for suicide. Although both groups considered family and friends the most intensely, those who aborted their attempts overwhelmingly viewed their family and friends, others' reactions, as well as their responsibilities, as reasons not to attempt. In contrast, those who attempted perceived these same factors as both motivations toward and against suicide to similar extents. These findings align with the interpersonal theory of suicide (Joiner, 2005; Van Orden et al., 2010) and the three-step theory (Klonsky & May, 2015), suggesting that perceived interpersonal factors play a critical role in suicidal ideation and behavior. Perceiving oneself as a burden to the family and the lack of meaningful social connections have been found as some of the most common reasons that people lean toward killing themselves (Franklin et al., 2017). On the other side, interpersonal factors also emerged to be the most prominent reasons individuals choose not to attempt suicide (e.g., Castro-Ramirez et al., 2023; Jobes & Mann, 1999). In a clinical setting, understanding how each individual views interpersonal factors is vital for effective intervention and support.

As expected, participants who aborted considered the pain, blood, and violence that are implicated in the capability for suicide more as reasons against suicide, whereas those who attempted considered them equally as reasons for and against suicide. Research on the capability for suicide suggests that individuals need to overcome an innate fear in engaging in a potentially painful or violent act before attempting suicide (Joiner, 2005). Some studies found evidence that attempters exhibit a greater fearlessness about death compared to ideators (Ferm et al., 2020; Smith et al., 2010, 2016), while other research did not find such differences (Burke et al., 2018; Forrest & Smith, 2017; Paashaus et al., 2019; Ren et al., 2019; Ribeiro et al., 2021). Our results revealed that fear played a larger role as a deterrent for those who aborted their attempts, while it was less of a concern for those who proceeded with their attempts. This minimal consideration of pain, blood, and violence may stem from fearlessness about death, a lack of awareness of one's fear, or a combination of both.

Within the six evaluated domains, the meaning of death emerged as the most prominent facilitator of suicide for both groups. This question asked if participants thought about what it means to die and gave some examples ("Some people are scared to die, others are indifferent, and others might think it's peaceful or restful"). Although this study did not collect data on the specific thoughts, results indicated that both groups envisioned positive outcomes of dying, such as experiencing peace or relief. This finding aligns with the escape theory of suicide, which suggests that individuals consider death as a desirable alternative to their current negative state (Baumeister, 1990). Despite "what it means to die" facilitated suicide the most, it is also important to emphasize that both groups only modestly considered it on average.

The fourth finding revealed distinct patterns in the duration of suicide decision-making between groups. On average, individuals who attempted suicide began experiencing suicidal thoughts 2 weeks prior, started mulling 3 h prior, and finalized their decision just 5 min before acting. In contrast, those who aborted their attempt experienced a more extended ideation-mulling-decision process, spanning from 1 month to 3 days to 3 h before aborting. Despite broad variation in the time spent at each decision-making stage within both groups, consistent patterns emerged. Among those who aborted, almost all (94%) began ideation more than 3 days prior, in contrast to approximately half (57%) of those who attempted. The onset of mulling ranged widely from 15 min to 1 month prior for both groups, with nearly all (92%) of the aborted attempts and around half (56%) of the suicide attempts beginning to mull at least 6 h beforehand.

Notably, the decision to attempt was made within 5 min prior to 60% of suicide attempts and 29% of aborted attempts. Moreover, 44% of those who eventually aborted their attempt had initially decided to attempt, implying the potential for a change of decision for some individuals. These findings are broadly consistent with prior research that found between 24% to 40% of decisions were made within 5 min of the attempt (Cáceda et al., 2020; Simon et al., 2001) and between 44% and 74% of decisions were made within 10 min (Deisenhammer et al., 2008; Paashaus et al., 2019). A 3-h cutoff between ideation to action has been commonly used as a metric to describe the degree of "premeditation" prior to suicide attempts (Bagge et al., 2013; Chalker et al., 2015). Using this criterion, only 6% of aborted attempts in this sample would be characterized as "impulsive" or lacking a clear decision-making process, compared to 30% of suicide attempts in this sample. This is slightly lower than the 42%–64% impulsive attempt rate reported in other studies (Bagge et al., 2013; Spokas et al., 2012). Overall, although the decision-making period varied widely for both aborted and suicide attempts, there was a clear trend toward longer decision-making times prior to aborted attempts compared to suicide attempts, despite the results not reaching statistical significance in this sample.

The last key finding is that the relationship between the SFC-SHC balance and decision-making duration differed for the two groups. Individuals who attempted suicide demonstrated a faster progression from ideation to action when they had a higher proportion of suicide-facilitating considerations. In other words, the more favorably they viewed the consequences of suicide, the shorter they waited to act after starting to ideate, starting to mull, and deciding to attempt. On the contrary, among those who aborted their attempt, a higher SFC-SHC balance was associated with an extended decision-making process, suggesting that the more favorably they viewed the consequences of suicide, the longer they contemplated suicide before stopping. One possible explanation is that for those who aborted, having suicide-facilitating considerations outweighing suicide-hindering ones prolonged the decision-making process and kept the option of attempting suicide in their mind for longer until the decision to stop was made.

Taken together, these findings address a common misconception by clarifying that the duration and degree of decision-making are distinct factors, each independently contribute to suicide risk profile. Individuals who had a long decision-making period and then aborted were more likely to view the consequences of suicide favorably. Consequently, despite aborting this time, they may be at increased risk for future ideation and attempt compared to those who aborted after a brief period of consideration. Future studies will benefit from measuring the duration, degree, and the influence of suicide decision-making altogether to better discern their predictive value for suicidal behavior.

Even though we compared the characteristics of aborted attempts and attempts, we want to emphasize that an aborted attempt is also a serious clinical outcome (Barber et al., 1998; Burke et al., 2016). Research on the clinical severity of aborted attempts is scarce and inconsistent. For example, Burke et al. (2016) found few differences in clinical symptoms between people who aborted and attempted, including the capability for suicide, whereas Rogers et al. (2020) found more severe symptoms among those who attempted. A recent study found that compared to active duty service members with a history of suicide attempt, those without a history of suicide attempt but had a history of aborted attempt were more likely to attempt in the following 3 months (Chu et al., 2023). In our sample, a substantial 88% of participants with a current aborted attempt

had previously aborted an attempt, and 63% of those who attempted this time had also previously aborted an attempt. This underscores the common occurrence of prior aborted attempts as precursors to both current aborted attempts and suicide attempts. Aborted attempts are often overlooked in research and clinical contexts (Chu et al., 2023), and it is crucial not to assume that individuals who have aborted an attempt in the past will do so again in the future. Moving forward, further research is needed to understand how past cognitive processes and suicidal behaviors influence proximal decision-making and actions. Specifically, how do past considerations and behaviors influence current decision-making? Longitudinal studies that account for past suicidal behaviors or track suicide decision-making over time are uniquely suited to answer these questions.

The findings of this study should be interpreted in the context of several limitations. Despite observing medium to large effect sizes, this preliminary study was underpowered; for instance, detecting a medium-sized effect (0.5) with a 0.8 power requires at least 64 participants per group. With only 30 and 16 participants per group, the study's power was capped at 0.57, potentially limiting the detection of smaller effect sizes and increasing the risk of Type I errors. Further, our sample was predominantly educated young White adults, which limits the generalizability of these findings. To mitigate the limitations, we employed permutation-based analysis to control for multiple comparisons, providing a more robust method for adjusting *p* values and reducing the risk of Type I errors. Additionally, in line with recent recommendations (Cumming, 2013; Funder & Ozer, 2019), we prioritized the interpretation of effect sizes over statistical significance. We presented these findings as a preliminary study, with the expectation that they will inform and guide future research with larger and more diverse samples, particularly in the understudied area of individuals who abort their suicide attempts.

Moreover, the precision of reports on considerations and timelines may be susceptible to imprecision, errors, or potential motivations to withhold information, given the context of inpatient interviews. Although assessments were conducted within 2 weeks of the suicidal episode to minimize recall bias, inaccuracy may remain. Another limitation in our measurements lies in the assessment of only six domains, potentially overlooking other areas of consideration. There also exists a potential for overlap among some of the examined domains. For instance, if an individual primarily focused on their family's reactions, this consideration might have been counted twice—both within "family and friends" and "others' reactions." Future studies should aim for assessments that offer greater specificity and clinical utility. Additionally, our study did not measure the exact timing and frequency of consideration. Consideration might span the entire mulling process, or it could also be sporadic or intermittent. A retrospective recall of when and for how long participants considered each consequence will also introduce challenges. Future studies can overcome these limitations by incorporating real-time monitoring methods during active decision-making. This approach could provide a more in-depth understanding of when individuals weigh the pros and cons of attempting suicide and how it correlates with their suicidal urges, ability to resist those urges, overall suicide intent, and engagement in suicidal behaviors (Tsypes et al., 2022). A more comprehensive understanding of suicide decision-making with more precise measurements will provide important information to identify risk profiles and inform clinical decision-making and targeted interventions (Teismann et al., 2024).

Taking one's own life is among the most consequential decisions a person can make. This study found that the key difference between individuals who stop their suicide attempt and those who proceed is not in the overall degree of consideration, but in how they evaluate the consequences of suicide and the time they spend making the decision. To the best of our knowledge, this is the first study to describe the nuanced cognitive process involved in aborted attempts. A deeper understanding of the suicide decision-making process, particularly the factors leading individuals to stop an attempt, has the potential to advance personalized suicide prevention strategies.

CONFLICT OF INTEREST STATEMENT

Dr. Nock receives publication royalties from Macmillan, Pearson, and UpToDate. He has been a paid consultant in the past 3 years for Apple, Microsoft Corporation, and COMPASS Pathways, and for legal cases regarding deaths by suicide. He has stock options in Cerebral Inc. and is an unpaid scientific advisor for Empatica, Koko, and TalkLife.

DATA AVAILABILITY STATEMENT

Data are available from the corresponding author upon request.

ETHICS STATEMENT

All study procedures were approved by the Harvard University-Area Institutional Review Board. Informed consent was obtained from all participants.

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