

Non-Suicidal Self Injury: Attention-Getting Behavior or A Dress Rehearsal for Death?

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Objectives

- Define non-suicidal self-injury (NSSI)
- Describe frequency, variability
- Motivation
- Risk factors and etiology
- Expected course
- Convergence and divergence from suicidal behavior
- Therapeutic approaches

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Definition of Non-suicidal self-injury (NSSI)

- **NSSI definition:** Direct, deliberate infliction of pain or tissue damage without suicidal intent
- Most common methods are scratching, superficial cutting, burning, picking of skin

How common is it?

- **World-wide**– the median rate of international studies is 18.0% lifetime prevalence
- **Single item** assessment leads to lower rates than assessment using **multiple items with specific behavioral descriptors** (12.5% vs. 23.6%).

Four-Factor Model of NSSI Motivations (Nock & Prinstein, 2004)

	Intra-personal	Interpersonal
Reinforcement for positive effects	Calm, positive feelings, punishing self	Attention, support
Reinforcement for negative effects	Decrease in negative emotion (e.g., anger, tension)	Escape from stressful situation (e.g., get peers to stop bullying)

Frequency of motivations: Automatic Reinforcement (%)

Reason	American “mild”	American mod-sev	Swedish mild/sev	Swedish (all)
Automatic negative reinforcement				
To relieve feeling numb or empty	15.3	33.3	32.2/91.1	45.6
To stop bad feelings	15.4	37.9	34.4/89.5	46.9
Automatic positive reinforcement				
To feel something, even if it is pain	16.9	41.4	26.0/78.9	38.0
To feel relaxed	22.9	32.8	19.3/63.2	29.3
To punish yourself	22.9	29.3	28.6/81.6	40.7

Lloyd-Richardson et al., 2007
Zetterqvist et al., 2013

Frequency of Motivations: Social-negative reinforcement (%)

Motivation	USA (mild)	USA (mod-sev)	Swedish mild/sev	Swedish (all)
To avoid school, work or other activities	28.0	29.9	12.7/35.8	17.9
To avoid doing something unpleasant that you don't want to do	12.7	32.2	9.1/30.5	14.0
To avoid being with people	17.8	23.6	4.6/27.4	9.8
To avoid punishment or paying the consequence	16.9	27.2	3.6/15.8	6.3

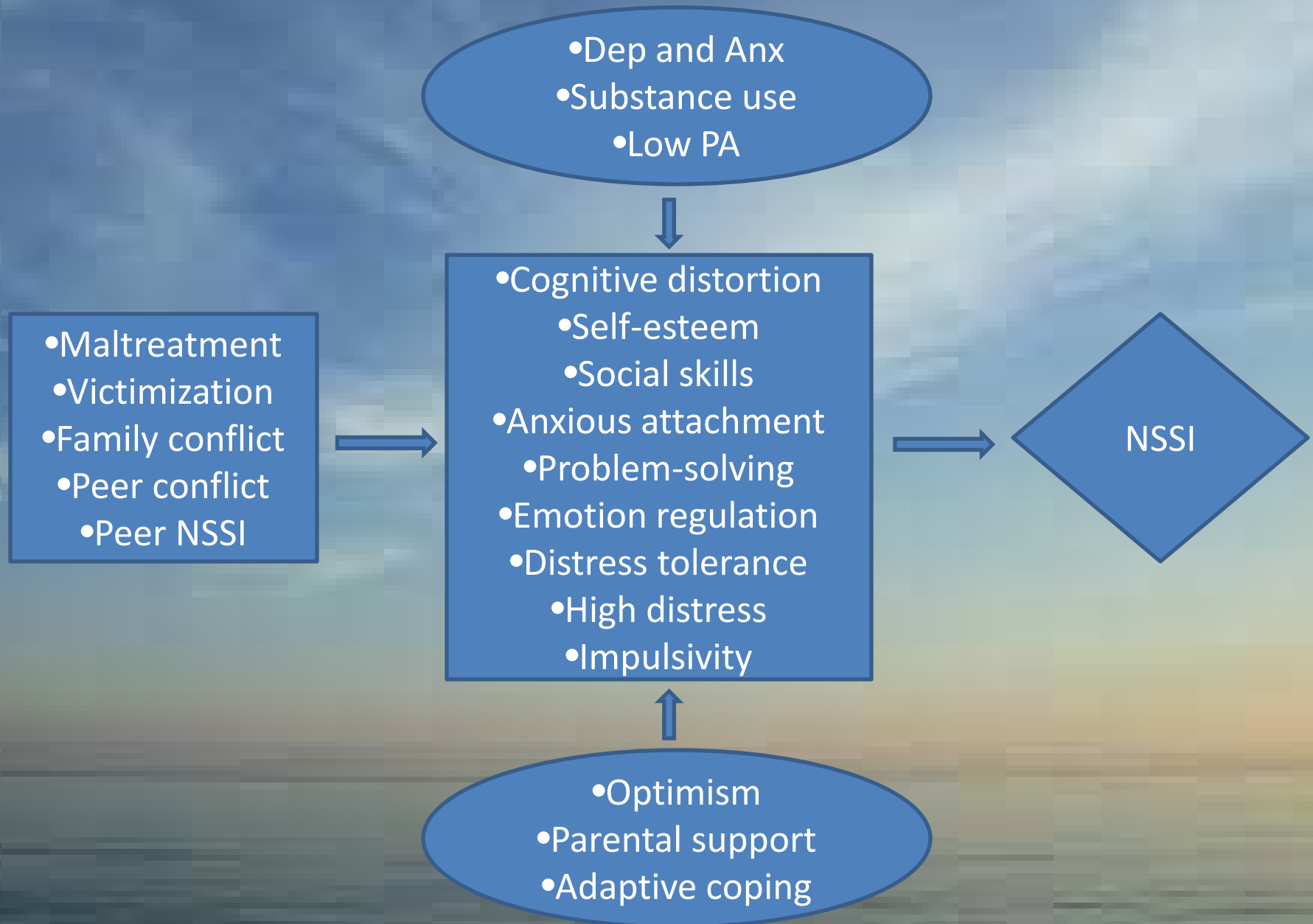
Frequency of Motivations: Social-positive reinforcement (%)

Motivation	USA (mild)	USA (mod-sev)	Swedish (mild/sev)	Swedish (all)
To get attention	24.6	35.6	15.3/28.9	18.4
To get a reaction from someone, even if it is negative	23.7	39.1	13.8/47.9	21.5
To get more attention from parents or friends	22.9	32.2	11.9/30.5	16.1
To feel more part of a group	13.6	25.9	5.3/6.8	5.6
To get your parents to understand or notice you more	14.4	29.3	10.4/31.1	15.1
To get control of a situation	25.4	37.4	20.1/59.9	28.9
To let others know how desperate you are	11.0	21.3	6.8/26.8	11.4
To make others angry	8.5	27.0	3.3/13.7	5.6
To do something when alone	19.5	36.2	15.5/34.7	19.9

Processes leading to NSSI

- **Desire for self-punishment**
 - May be related to early adversity, criticism
 - May increase vulnerability to victimization
- **Increased arousal to stress**
 - Low distress tolerance
 - Poor emotion regulation
- **Poor social problem-solving and communication**
 - Therefore, may “communicate” via self-injury
- **Increased pain tolerance**
 - Low levels of β -endorphin
 - Increased number of opioid receptors, sometimes due to early adversity
 - Self-injury therefore very reinforcing

Model of Development of NSSI



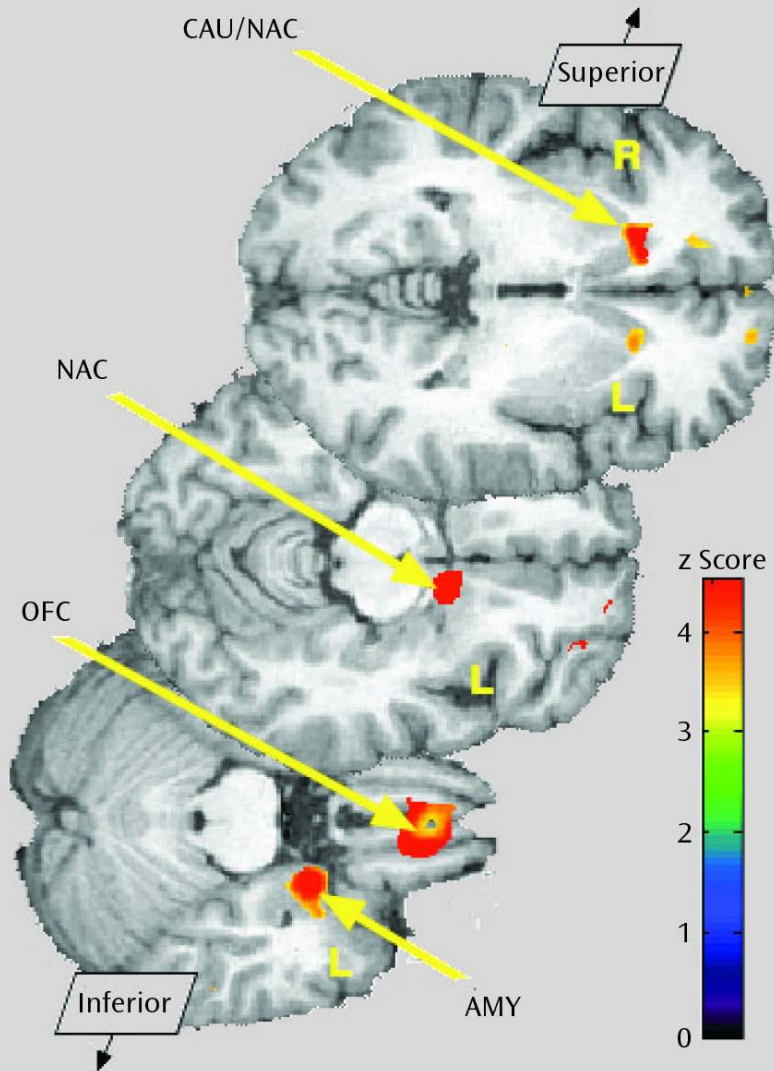
Pain sensitivity and NSSI

- Motivation often to “feel something” or “induce pain”
- Pain offset induces positive affect and decreases negative affect (Franklin et al., 2013)
- Those with NSSI have higher pain threshold (Germain & Hooley, 2013)
- Emotion dysregulation correlated with pain tolerance (Franklin et al., 2012)
- Those who experience pain have the **highest** NSSI frequency (Selby et al., 2013)

Opioid hypothesis

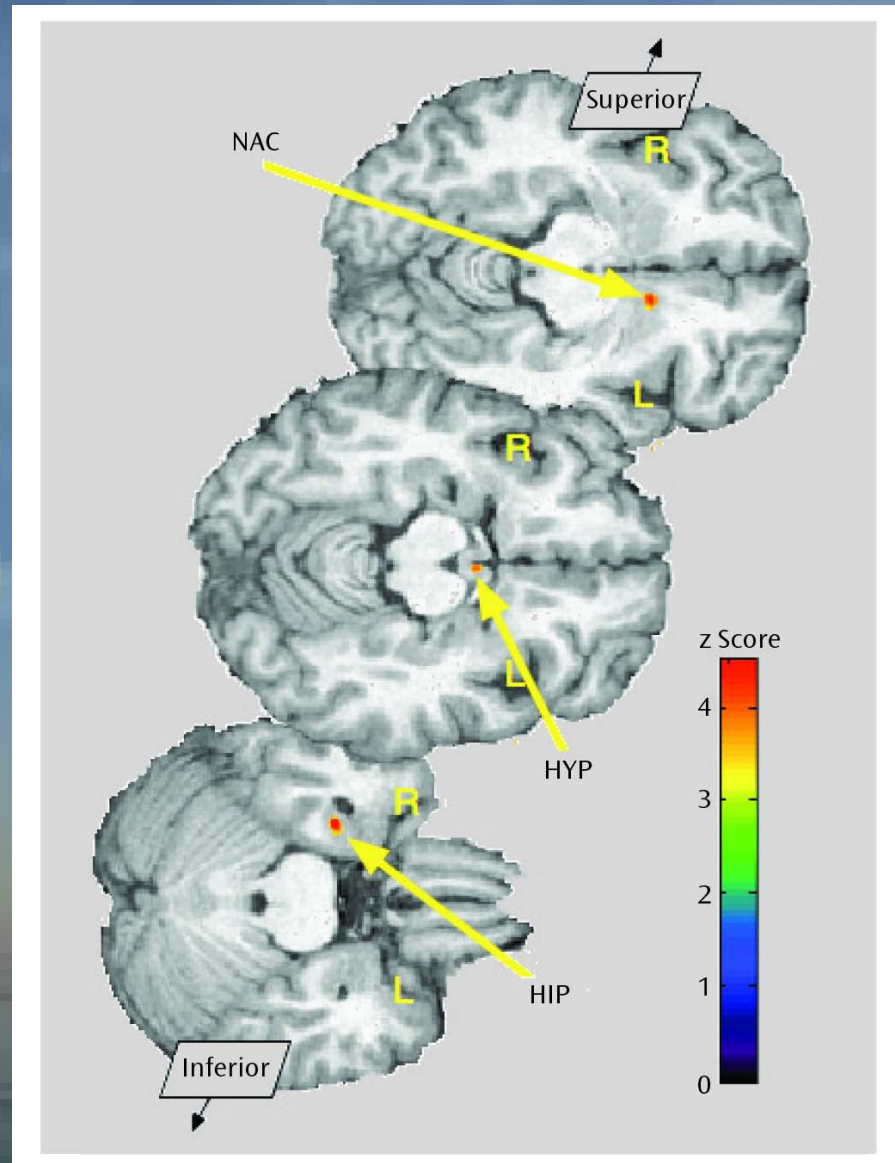
- In patients with borderline personality disorder (BPD), lower levels of β -endorphin in CSF compared to controls (Stanley et al., 2010)
- PET studies of BPD show higher mu-opioid receptor density at rest but decreased neurotransmission during sadness induction
- Thus, NSSI could release endogenous opioids, which would be more reinforcing in a person with BPD because of the higher density
- Since sadness decreases opioid neurotransmission, the endorphin release from NSSI would be even more reinforcing (Prossin et al., 2010)

Greater Regional μ -Opioid BP_{ND} in Patients With Borderline Personality Disorder Relative to Healthy Comparison Subjects^a



^a Significant z score color values are superimposed over an anatomically standardized magnetic resonance image in axial views. Image data are displayed in radiological convention so that the upper side of the image corresponds to the right side of the brain. CAU=nucleus caudate; NAC=nucleus accumbens; OFC=orbitofrontal cortex, AMY=amygdala.

Significantly Greater Deactivation of μ -Opioid Receptor-Mediated Neurotransmission During Sustained Sadness in Patients With Borderline Personality Disorder Relative to Healthy Comparison Subjects^a



^a Significant z score color values are superimposed over an anatomically standardized magnetic resonance image in axial views. Image data are displayed in radiological convention so that the upper side of the image corresponds to the right side of the brain. NAC=nucleus accumbens; HYP=hypothalamus; HIP=hippocampus.

Two weeks in the life of someone with thoughts of NSSI (Nock et al., 2009)

- 5.0 thoughts/1.6 acts of NSSI/wk
- Most often occurs when alone, least often with family
- Antecedents
 - Feeling rejected
 - Anger towards self or others
 - Numb/feeling ‘nothing’
 - In contrast- negative affect *per se* was more related to suicidal ideation

Two weeks in the life of someone engaging in NSSI (Selby et al., 2013)

- Most common reasons given for NSSI were Automatic positive reinforcement (APR) (53%)
- Those with an APR had more and longer NSSI thoughts and engaged in more NSSI
- Also had more binge eating and alcohol use
- Those who engaged in the most NSSI also experienced the most pain and the most “satisfaction” afterwards

Course of NSSI

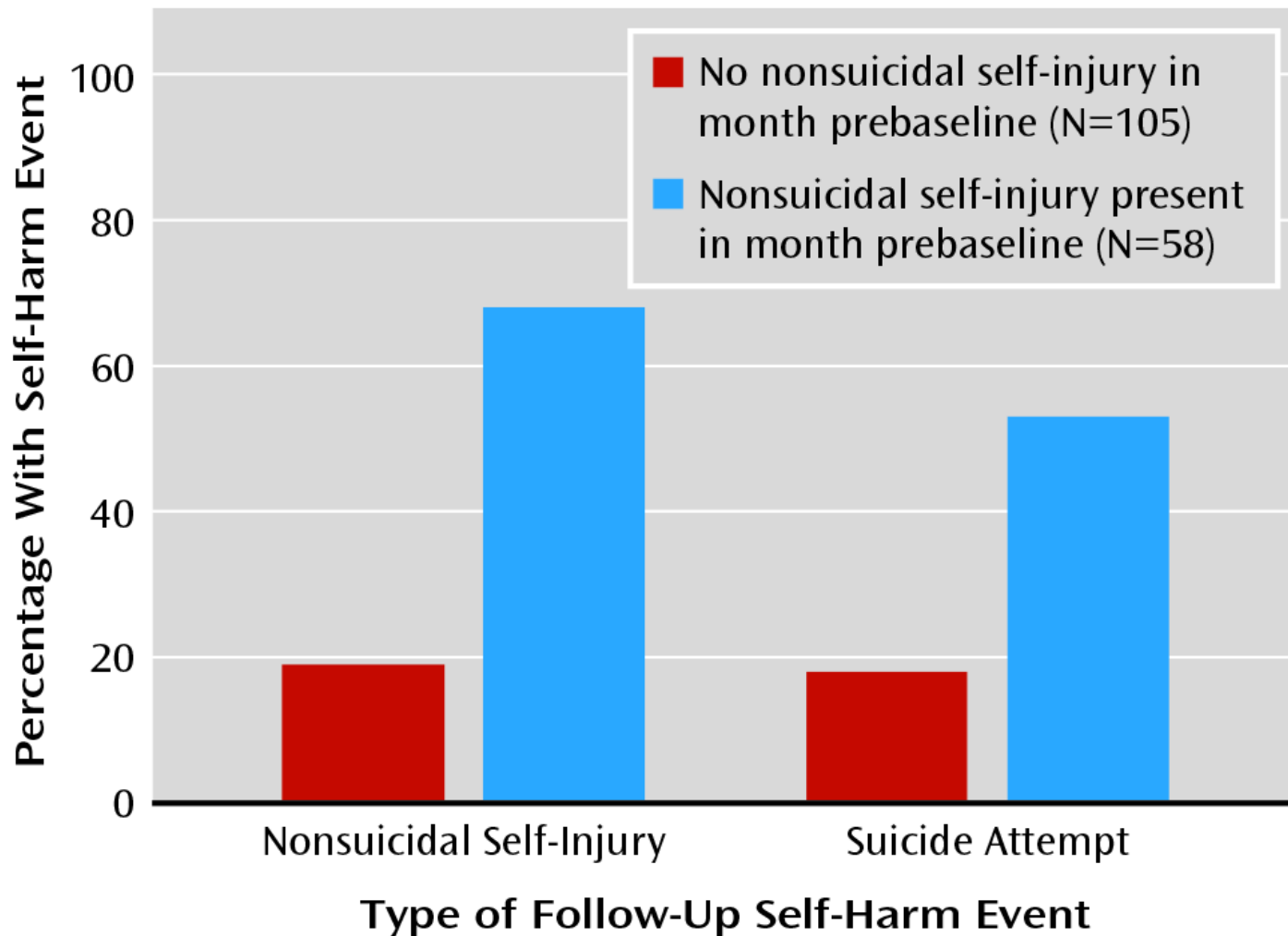
- **Predictors of onset:** depression, cognitive distortion, parental depression, close friend with NSSI
- **Predicts future NSSI**– more frequent, severe, multiple methods, friend with NSSI, depression
- Correlated with **health-risk behaviors**
- Predicts **suicide attempts**

Multivariate Predictors of Risk of Nonsuicidal Self-Injury in Depressed Adolescents During 28 Weeks of Follow-Up^a

Variables	Risk of Nonsuicidal Self-Injury		
	Odds Ratio	95% CI	P
Suicidality item from the Children's Depression Rating Scale-Revised	0.90	0.55-1.49	0.7
Prebaseline Nonsuicidal self-injury	20.3	6.87-60.1	<0.0005
Nonsuicidality items from the Children's Depression Rating Scale-Revised	0.60	0.35-1.04	0.067
Hopelessness	3.70	1.39-9.81	0.009
Family functioning	1.13	0.72-1.78	0.6
Anxiety Disorder	3.71	1.28-10.78	0.016
Age	0.57	0.39-0.85	0.005
Female	4.80	1.54-15.0	0.007

^a Likelihood ratio $\chi^2=65$, $df=9$, $p<0.00005$. Pseudo $R^2=0.32$. Hosmer-Lemeshow $\chi^2=5$, $df=8$, $p=0.8$. Maximum variance inflation factor=1.30. All Children's Depression Rating Scale-Revised measures and family functioning are z-transformed scores, with one unit representing one standard deviation.

Effects of Baseline Nonsuicidal Self-Injury on Risk of Harm Events in Adolescents With Major Depression Over 28 weeks of Follow-Up



NSSI Predicts Suicide Attempts (ORs)

Study	NSSI	Impulsive Aggression	Suicide Attempt hx	hopelessness	Family functioning
Wilkinson et al., 2011	3.2	-----	1.4	1.6	2.1
Asarnow et al., 2012	5.3	-----	1.9	1.1	-----
Cox et al., 2012	5.9	1.1	3.2		

Motivations of NSSI and SA

Motivation	Suicide Attempt	Non-Suicidal Self Injury
To die	++	--
To relieve negative affect	--	++
To feel something	--	++
To escape	++	++
To get attention	++	++
To express a feeling	++	++
To feel more part of a group	--	++
Immediate automatic reinforcement	--	++

Comparison of Risks for Suicide Attempts and for NSSI

Variable	Suicide Attempt	NSSI
Younger age	** (M=18 yrs.)	** (M= 13.7 yrs)
Depression severity	***	*
Suicidal ideation	***	**
Impulsive aggression	**	*
Parent history attempt	*	--
Parent self-report depression symptoms	*	--
Parental history abuse	**	--
Family function	**	*

*Melhem et al., 2007; Cox et al., 2012;
Wilkinson et al., 2011

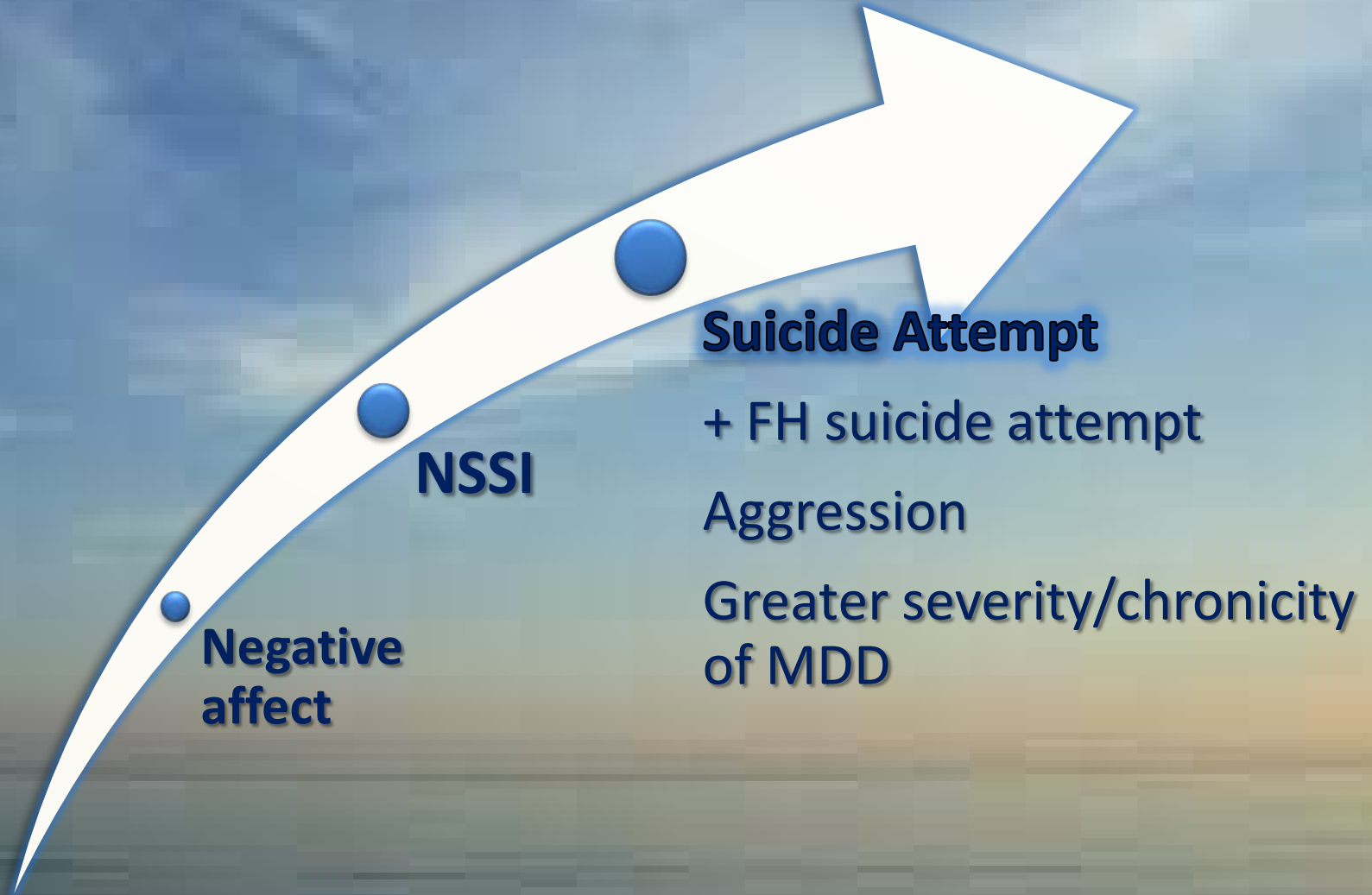
Family history and NSSI

- Avon longitudinal study
- 4396 mother-child and 2541 father-child pairs
- Adjusting for parental depression, maternal suicidal behavior related to:
 - 2.94 fold increase in child attempts
 - 0.83-fold increase in NSSI (i.e., no increase)

Characteristics of NSSI and SA

Domain	NSSI	SA
Method	Cutting, carving, burning	Overdose, hanging, jumping, shooting, slashing
Motivation	End negative feeling, escape bad situation, get help, punish self	To die, to escape impossible situation/feeling, to express feeling, to get help
Risk Factors	Mood disorder, emotion dysregulation, abuse, discord, ?ADHD, SA	Mood disorder, conduct disorder, substance abuse, aggression, abuse, FH suicide, NSSI
Neurobiology	Low CSF beta-endorphin, upregulation of mu-opioid receptors	Low CSF 5-HIAA, down-regulation of pre- and up-regulation of post-synaptic serotonergic receptors in OPFC

Developmental Process of NSSI and SA



Alternative explanations

- Joiner hypothesis: NSSI lowers the threshold for engaging in self-harm behavior
- Behaviors on same continuum
- Perhaps because SA is less common and NSSI is a more common “signal” and therefore precursor that occurs at a younger age

Treatment of NSSI

- Wilkinson et al., 2011– Reduction in depression associated with cessation of NSSI
- Emotion Regulation Group Therapy (ERGT)- reduction in self-harm behaviors in adults with BPD, $d=.6$
- Resourceful Adolescent Parenting Program (RAP-P; Pineda & Dadds, 2013)
- Mentalization– (Rossouw & Fonagy, 2012)

Resourceful Adolescent Parenting Program RAP-P

- **Session 1:** Psychoeducation about self-harm behavior, accessing services, safety plan
- **Session 2:** Identification of parenting strengths, managing parental stress
- **Session 3:** Adolescent development and fostering teen self-esteem, balancing monitoring and promotion of autonomy
- **Session 4:** Family harmony and management of conflict

RAP-P Results

- In 48 clinically referred youth with deliberate self-harm, RAP-P + TAU vs. TAU:
 - Reduction in self-harm behavior, function, and improvement in symptoms
 - Change in family climate
 - RAP-P's effects on self-harm mediated by change in family climate

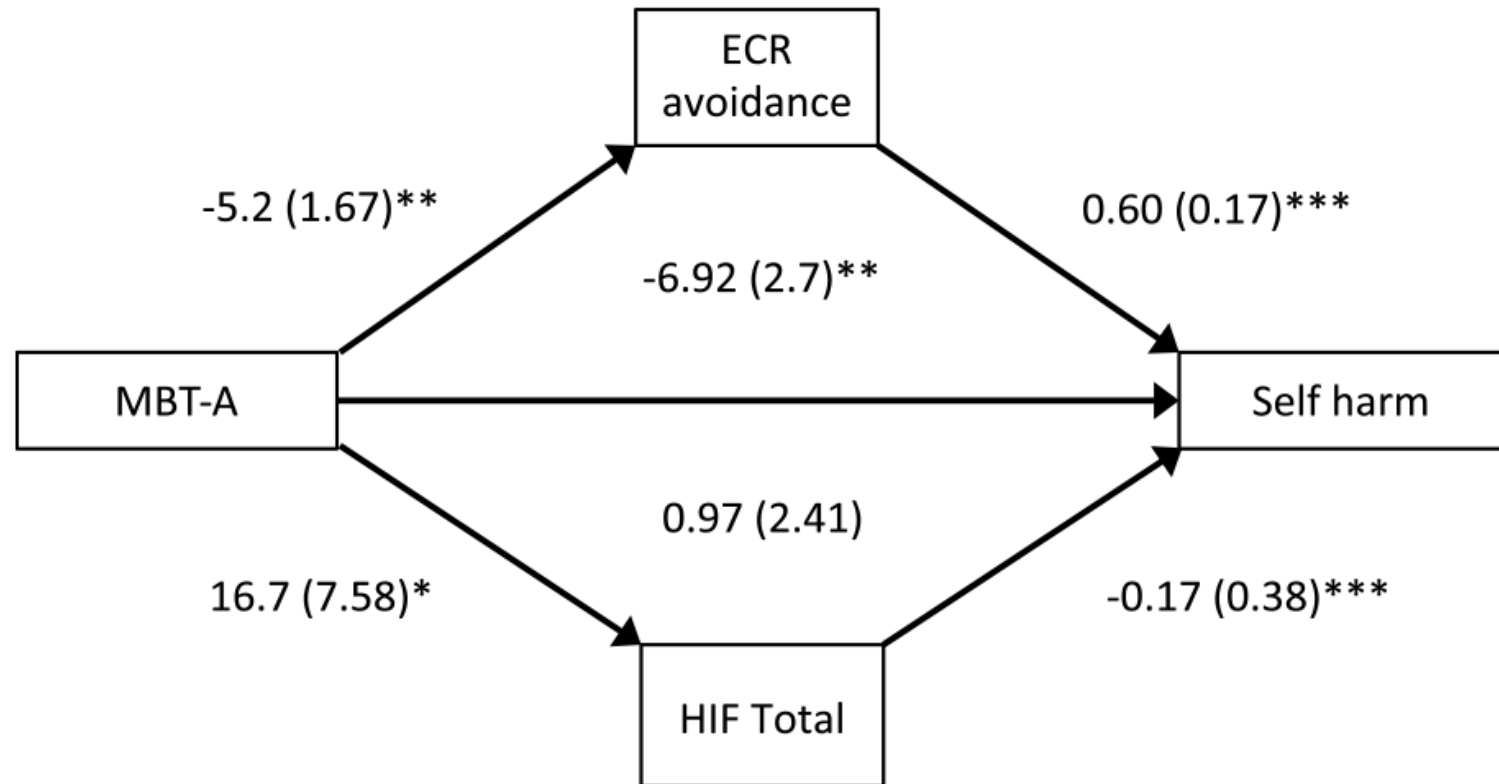
Mentalization (Rossouw & Fonagy, 2012)

- **Mentalization:** ability to represent action in terms of thoughts and feelings
- Better ability means can formulate action plans even in the face of strong affect, and lesser leads to impulsive, and emotion-focused coping
- In this study, 80 self-harming adolescents randomized to either Mentalization or TAU
- There was a concomitant group for parents in the Mentalization treatment 1/month.

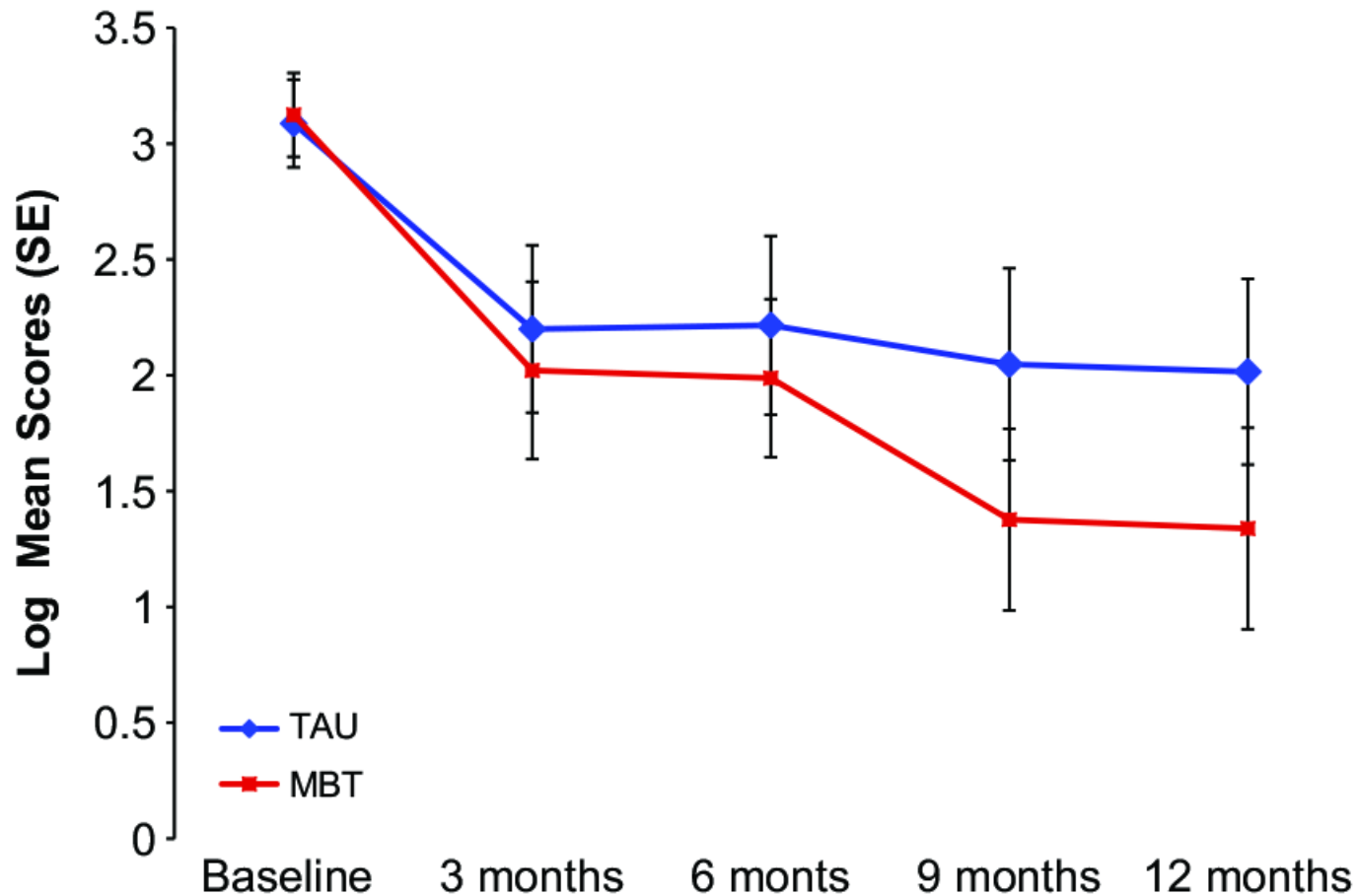
Mentalization: Findings

- Associated with greater reductions in depression, borderline features and self-harm
- Proportion self-harming 56% vs. 83% at end of treatment
- Results explained in part by changes in attachment to more secure and ability to mentalize

Mediation of effect of mentalization-based treatment for self-harm in adolescents (MBT-A) on self harm scores at the end of treatment



Self-harm for both groups over time on the Risk Taking and Self-Harm Inventory



Elements of efficacious treatment

- Coping or safety plan
- Relief of negative affect
- Emotion regulation
- Distress tolerance
- Interpersonal effectiveness
- Response inhibition and problem solving
- Augment social connection and social support

Safety Plan: Definition and Conditions

Definition: Structured plan for coping with suicidal or self-harm urges

1. Promises family and clinician not to engage in suicidal behavior
2. Will implement safety plan if become suicidal or engaging in self-harm
3. Safety plan based on review of precipitants, vulnerabilities, cognitions, emotions leading to behavior

Safety Plan: Strategies

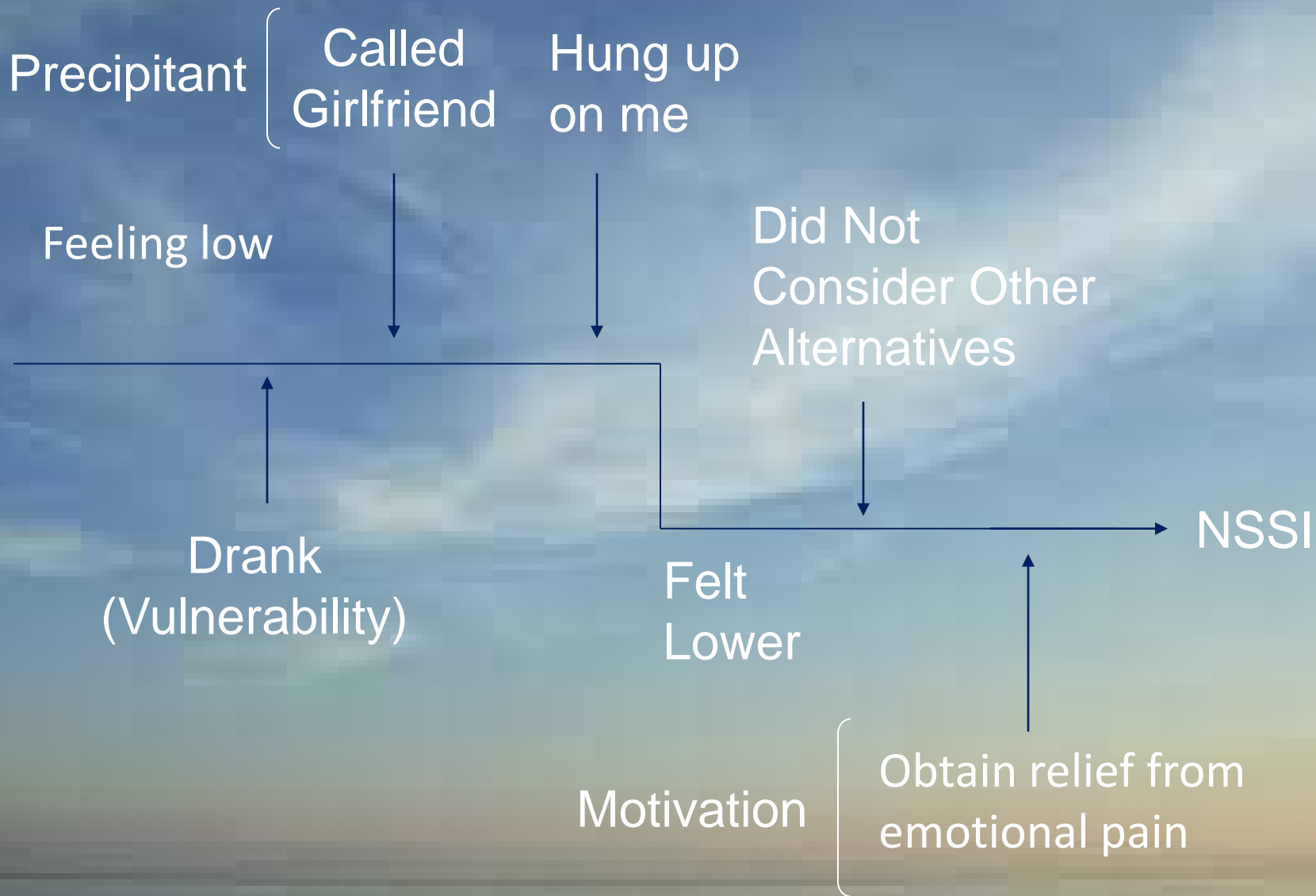
1. Avoid activities or situations that may trigger suicidal thoughts (discord, isolation, drugs)
2. “Truce”
3. Internal: Emotion regulation, distraction, exercise
4. Interpersonal: Contact friend, parent
5. Clinical: Contact therapist, ER
6. Write it down: coping card
7. Assess confidence to implement, anticipate barriers

Chain Analysis

- Reconstruct events, thoughts, feelings leading up to the suicide attempt
- “Freeze frame” (Wexler, 1991)
- Identifies precipitants, motivation, intent, current reaction, reaction of environment
- Identifies stressors and vulnerabilities, in order to develop a case conceptualization

Chain Analysis: Example

- **TH:** Could you tell me about the events leading up to your suicide attempt?
- **PT:** I was feeling low, so I drank some of my dad's scotch and called my girlfriend.
- **TH:** And?
- **PT:** She hung up on me.
- **TH:** What did you think and feel then?
- **PT:** I was bummed, thought what the hell, might as well end it.
- **TH:** Did you consider anything else?
- **PT:** Not really...



Example of a Safety Plan

- **Avoid Precipitants:** Don't call girlfriend, don't drink
- **Internal coping:** listening to music, exercise, meditation, avoid stressful discussion
- **External coping:** calling friend, talking with parents
- **Clinical contact:** therapist, on-call clinician, ER

Treatment Plan

- Based on chain analysis, identify cognitive, behavioral, affective, and contextual triggers
- Ask to rank order how problematic these issues are, and how likely if they worsen would they lead to another attempt
- Discuss possible interventions to address those problems.
- Ask patient/family to rank order interventions on appeal and likelihood of success
- Choose interventions based on product of likelihood of success and willingness of patient/family to carry out a particular intervention

Treatment Plan: Example

Contributor to NSSI	Possible Intervention
Could not stand pain	Distress tolerance
Wanted to express hostility	Assertiveness, communication skills
Could not generate alternative solutions	Problem-solving
Drank	Treatment for alcohol abuse?
Low mood	Treat depression?

Summary

- NSSI- occurs in about 20% of youth
- More frequent and more severe associated with persistence, more psychological symptoms, and suicidal behavior
- Motivations are to regulate self or social environment
- NSSI is a risk factor for suicidal behavior
- Treatment involves understanding of motivation, development of a safety plan, relief of negative affect, improvement in ability to cope with negative affect, and augmentation of family support