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EMDR Interventions in Addiction

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The use of tobacco, alcohol, and illicit drugs is widespread and has significant negative consequences for the individual, their families, and the communities to which they belong. A substantial number of users develop an addiction disorder. Cure-oriented addiction treatment is challenging regarding treatment retention and relapse rates. Here, we discuss the potential of eye movement desensitization and reprocessing (EMDR) therapy to aid addiction treatment. Two approaches are distinguished: trauma-focused and addiction-focused EMDR therapy. Existing adapted EMDR protocols and research on both approaches is critically reviewed. Despite 20 years of development and research, the feasibility and efficacy of addiction-focused EMDR therapy is still largely uninvestigated. Exciting new possibilities, offered by research on working memory theory, are discussed. An overview of all resourcing and EMDR therapy interventions in addiction is presented: the palette of EMDR interventions in addiction (PEIA). The article finishes with recommendations for further research in this field.

Keywords: craving; addiction; working memory; eye movement desensitization and reprocessing (EMDR) therapy; flashforwards; positive targets

The use of tobacco, alcohol, and illicit drugs is widespread and has significant negative implications for public health, the economy, and societies. For instance, smoking harms nearly every organ of the body and kills almost half of tobacco users (U.S. Department of Health and Human Services [HHS], 2014; World Health Organization [WHO], 2015). Most smokers are aware of the dangers; 80% want to quit but only 45% eventually do so. Harmful use of alcohol is also an important risk factor for morbidity, disability, and mortality, implicated in more than 200 disease and injury conditions (WHO, 2014). It results in 5.9% of all global deaths each year. Regarding illicit drug use, in 2013, approximately 5% of the world's population aged 15–64 years used these substances (United Nations Office on Drugs and Crime [UNODC], 2015). Of these, more than 10% suffers from drug use disorders (drug addiction and harmful use). An estimated 187,100 deaths were drug-related (often caused by overdose) in 2013.

In lay terms, "addiction" refers not only to formally recognized substance use disorders but also to problematic behaviors such as shopping, eating, sex, work, sport, game, Internet, and social media "addiction." Pathological gambling, the most thoroughly studied of these behavioral addictions, has been included in the latest version of the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed., *DSM-5*) in the "Substance-Related and Addictive Disorders" section (American Psychiatric Association [APA], 2013). Other "behavioral addictions" are dispersed across the sections "Disruptive, Impulse Control and Conduct Disorders," "Obsessive-Compulsive and Related Disorders," and "Feeding and Eating Disorders." In addition, problematic behaviors such as exhibitionism, kleptomania, and stalking also share features of

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addictions such as impulsivity and urges. The same goes for binge-eating disorder, and even anorexia and bulimia nervosa are noted by some as "food addictions." Internet-gaming is a behavioral addiction under review.

Substance use and behavioral addictions have in common that they provide short-term reinforcement that may engender persistent problematic behavior despite full awareness of adverse long-term consequences. When people seek help, there is often a strong wish to discontinue the behavior and simultaneously a felt incapability to do so. Diminished self-control is thus a core feature of both substance use disorders and behavioral addictions. Other commonalities are the presence of urges or craving, tolerance symptoms (the need for more and stronger incentives), withdrawal symptoms (both physical and psychological symptoms following discontinuation of the behavior), compulsivity, and impulsivity.

Addiction as a Multifactorial Determined Disorder

Some people are more vulnerable than others to develop an addiction disorder. Of particular importance is that early life experiences are an important risk factor (Enoch, 2011). In a large epidemiological study—the Adverse Childhood Experiences (ACEs) study—it was shown that the number of retrospectively reported ACEs (experienced before age 18 years) was highly associated with the incidence of addictive behaviors later in life (Felitti et al., 1998). Of interest is that traumatic experiences in childhood are also associated with a general vulnerability and the occurrence of somatic and psychiatric comorbidity, which may not include the typical symptoms seen in posttraumatic stress disorder (PTSD; Felitti et al., 1998). So although these ACEs form an important risk factor regarding the development of an addiction, they may also go unnoticed or unreported when screening for PTSD.

Once vulnerable individuals come into contact with a particular substance or a behavior, other factors add to the transition from recreational use to addiction. Addictive behavior is characterized by compulsive engagement in reinforcing stimuli (Wise & Koob, 2014). The source of reinforcement can either be internal (e.g., positive emotions and physical sensations) or contextual (e.g., peer group approval). It is assumed that the first increase in problematic behavior is driven by positive reinforcement but as the addiction progresses, negative reinforcement reflecting relief (e.g., reduced-tension or reduced-withdrawal symptoms) or avoidance (e.g., of burdensome responsibilities) becomes more and more important. In accordance with the self-medication hypothesis (Khantzian, 1985) negative reinforcement may also reflect an early motive for ongoing use in first-time users with psychiatric problems (e.g., depressed mood, anxiety, or posttraumatic intrusions).

Recently, Müller (2013) emphasized the role of strong episodic memories that are activated when anticipating or experiencing drug effects, withdrawal symptoms, craving, and relapse. These memories or—more specifically—memory representations are part of what has been called "the addiction memory" (Boening, 2001). These memory representations are activated not only by actual use or behavior but also by anticipation or imagining the behavior or the effects (Müller, 2013). In other words, whenever a memory representation of the addiction memory is triggered, it may induce positive feelings (e.g., when imagining use in a positive valenced context such as using with friends), a negative feeling (e.g., when remembering a relapse as a personal failure) or craving (e.g., when imagining imminent use). Individuals may also be triggered by *imagining* a possible addiction-related situation (e.g., a bland life when abstinent) or idealized future incident (e.g., winning the jackpot). As long as activated memory representations are emotionally charged (positively, negatively, or by craving) they are thought to be capable of motivating and influencing behavior.

Challenges in Addiction Treatment

From a global perspective, most problematic substance users have no access to treatment (UNODC, 2015). Many patients, who do have access, drop out of treatment prematurely (National Institute on Drug Abuse [NIDA], 2012). Substance use addiction is seen as a chronic condition characterized by periodic relapses, so treatment often requires multiple interventions and regular, ongoing monitoring. In accordance, 1-year treatment outcomes across alcohol, nicotine, and illicit drug abuse studies show that more than 85% of patients relapse in that period (Brandon, Vidrine, & Litvin, 2007). However, the problem with these figures is that relapse (any return of the problem behavior after a period of initial remission) is a binary outcome while, in fact, much progress may have been made (e.g., a substantial reduction of substance use compared to pretreatment levels). In accordance, of those who seek and find professional help and remain in treatment, in the end most find a way to abstain from substances, which is associated with decreased

criminal activity, and improvements in occupational, social, and psychological functioning (NIDA, 2012).

Cognitive-behavioral treatment (CBT) approaches focus on engaging addicts in treatment, providing incentives to remain abstinent, modify relevant attitudes and behaviors, and enhance coping skills to handle stress and craving, and to prevent relapses. Homework assignments are usually an important ingredient. Typical interventions for addiction thus aim to enhance self-control, but at the same time, a certain level of self-control is required to do so successfully (Anthes, 2014). Thus, the effectiveness of most of the existing treatment programs relies heavily on self-control and, by extension, proper executive or prefrontal cortex (PFC) functioning. However, PFC functioning is not only often compromised by the addiction but its disruption may also precede the addiction (associated with problems such as attention deficit hyperactivity disorder [ADHD] and learning difficulties) and confer a vulnerability for its development (Goldstein & Volkow, 2011; Yücel, Lubman, Solowij, & Brewer, 2007). So although strengthening PFC functioning may be a worthwhile goal, a focus on self-control strategies and homework assignments may also increase dropout rates in those who experience high levels of frustration when trying to exercise self-control.

To some extent, pharmacotherapy (aimed at reducing craving, blocking the effect of opioids or inducing aversive sensations after alcohol consumption) may increase treatment success (McHugh, Hearon, & Otto, 2010). In addition, pharmacotherapy comes with some feasibility issues limiting its efficacy, such as unsafe use or misuse. Many patients also stop taking or refuse medication because of side effects, limited effectiveness, or principal views on medication use. Finally, for most addictions, there are no effective pharmacotherapeutic options.

In summary, the effectiveness of existing addiction treatments is limited when we look at both treatment retention and relapse rates. There is a need for interventions that are well tolerated and accepted, depend less on self-control strategies and increase the time-to-relapse and reduce their severity. Eye movement desensitization and reprocessing (EMDR) therapy (Shapiro, 2001) may fit these requirements. EMDR therapy is a well-known therapy for the treatment of PTSD (Cusack et al., 2016). As such, it can be applied in addiction disorders to treat comorbid PTSD and other symptoms resulting from adverse, traumatic life experiences. In addition, adapted EMDR therapy protocols that focus on the addiction itself have shown some promise as well, especially in alcohol use disorder (Hase, Schallmayer, & Sack, 2008). Existing literature on both trauma-focused (TF-EMDR) and addiction-focused (AF-EMDR) EMDR therapy will be discussed in the following text.

EMDR Therapy and Addiction

EMDR therapy is a phased, integrative psychotherapy approach guided by the adaptive information processing (AIP) model (Shapiro, 2001). The AIP model posits that psychopathology is driven by dysfunctionally stored memories that—when activated—are accompanied by high levels of arousal. High levels of emotional arousal may either be positive or negative. For the brain, the use of a psychoactive drug is also a physiologically stressful—pharmacologically induced—event irrespective whether the subjective experience has a positive or negative valence (Sinha, 2008). In accordance, drug-induced deregulation of stress and arousal systems in the brain is observed in addiction (Martin-Fardon, Zorrilla, Ciccocioppo, & Weiss, 2010).

According to the AIP model, memory representations of high arousal events are stored dysfunctionally with the original emotions, physical sensations, and beliefs available during these events (Shapiro, 2001). Neuroscience research has shown that the brain has a possibility to unlock "frozen memories" (open up synaptic connections), a type of neuroplasticity known as memory reconsolidation (Ecker, Ticic, & Hulley, 2012). After the initial storage of an event (a process called consolidation), memories become plastic again during recall, allowing new learning to be reencoded or rewritten in memory. Thus, depending on characteristics of the new situation, a memory can be merged with related memories (e.g., repeated use in addiction) or new meanings and new insights can be added, resulting in weakening, modification or strengthening of the original learning. Reconsolidation or "updating" of a previously acquired memory can thus change the original memories for better (e.g., successful therapy) or worse (retraumatization). EMDR therapy seems to exploit the reconsolidation principle (Solomon & Shapiro, 2008): Eye movements lead to a weakening or desensitizing of the original memory (Lee & Cuijpers, 2012) and the chain of associations stimulates the modification of meanings. The reprocessed memory is then reconsolidated into long-term storage, and if the goal is achieved, generating less distressing impact on subsequent retrieval activation or—in the case of addiction—may induce less craving and drug-seeking behavior. The AIP model was described long before the term reconsolidation was

introduced, but is fully in line with these new developments in neuroscience.

As stated earlier, two global aims for the use of EMDR in addiction can be distinguished: (a) TF-EMDR, the use of standard EMDR therapy to assist recovery from addiction by treating underlying trauma and comorbid PTSD, and (b) AF-EMDR, the use of "adapted" EMDR therapy to target nontrauma memory representations of addiction. Of course, both approaches can be integrated and combined. Table 1 gives an overview of peer reviewed, English language articles on the feasibility and potential efficacy of EMDR therapy in addiction. Although the methodological quality varies widely and most "evidence" consists of anecdotal reports and uncontrolled case series, it provides an overview of existing, often promising, EMDR therapy strategies in the treatment of addiction.

Trauma-Focused EMDR in Addicted Patients With Comorbid Posttraumatic Stress Disorder

PTSD and addiction often occur together, and the comorbidity is recognized as difficult to treat with higher treatment dropout and poorer outcome rates than for either condition alone (Flanagan, Korte, Killeen, & Back, 2016). Table 1 shows numerous studies where EMDR has been applied as TF treatment (TF-EMDR) in patients with PTSD-addiction comorbidity (Abel & O'Brien, 2010; Brown, Gilman, Goodman, Adler-Tapia, & Freng, 2015; Kullack & Laugharne, 2016; Marich, 2009; Perez-Dandieu & Tapia, 2014; Rougemont-Bücking & Zimmermann, 2012; Shapiro, Vogelmann-Sine, & Sine, 1994; Zweben & Yeary, 2006). In general, EMDR seems to have good results for comorbid PTSD symptoms but has only limited effects on addiction outcomes, although the recent study of Brown and colleagues (2015) is promising in this respect. To understand the potential of EMDR on addiction in comorbid PTSD, all literature on PTSD treatment in addiction is relevant, not only EMDR. In a recent review (Roberts, Roberts, Jones, & Bisson, 2015), all existing behavioral therapies for PTSD and comorbid substance use disorder were analyzed. The review was limited to randomized controlled trials (RCTs), so for EMDR only the Perez-Dandieu and Tapia (2014) study was included. Unfortunately, it was nevertheless rejected still, because PTSD was not established through formal and reliable means. However, the conclusion based on 13 RCTs (more than 1,500 patients) is in accordance with the Perez-Dandieu and Tapia (2014) study: trauma therapy delivered alongside addiction-treatment reduces PTSD severity—and thus is in itself highly valuable—but has only limited effect on the addiction itself. If any, the effect is at the long term; it does not immediately help patients to abstain from addictive behavior. At first sight, these findings seem to be at odds with the (uncontrolled) study of Brown and colleagues (2015), who found that voluntary TF treatment (EMDR) seems to significantly improve existing court program outcomes, even if symptoms were below PTSD-threshold (see Table 1). It may well be that the main effect of trauma therapy on addiction is indirect in that it enhances the feasibility and effectiveness of parallel or subsequent addiction treatment. It is also possible that voluntary commitment to trauma treatment is important. In accordance, the review of Roberts and colleagues (2015) found that participants allocated to a trauma-focused therapy (TFT) condition compared to treatment as usual (TAU) were less likely to complete treatment.

Because of the dropout rates and concerns about the applicability of TFT in addicted patients, some authors (Gerger, Munder, & Barth, 2014) highlight the possible benefits from non-TF trauma treatment, for example, the seeking safety group program for traumatized addicted people. However, Roberts and colleagues (2015) concluded in their review that non-TF trauma treatments are ineffective for PTSD symptomatology in addiction. Likewise, the often-recommended phase-based treatment for individuals with more complex clinical problems (Herman, 1992) is currently under serious discussion. The main objection is that there is hardly any evidence supporting this approach (de Jongh et al., 2016) and that it may unnecessarily postpone TF interventions. Supporters of a phased approach emphasize the necessity of a stabilization phase to reinforce a sense of safety and reduction of symptoms through improving self-management and emotional regulation (Cloitre et al., 2011). However, in the review by Roberts and colleagues (2015) as well as in a specific review regarding potential contraindications for PTSD treatment (Van Minnen, Harned, Zoellner, & Mills, 2012), it was found that trauma treatment can be safe and effective despite serious psychiatric comorbidity and substance use. This is also the conclusion of the researchers and authors of the research in Table 1: Although TF-EMDR can be challenging, it is feasible and safe. Nevertheless, high dropout rates in patients with high comorbidity and treatment-interfering stressors ask for novel avenues for efficacy research. In recent years, intensive TF-CBT for PTSD has been developed and found to be as effective as standard CBT applied on a weekly basis (e.g., Ehlers et al., 2014), for example,

TABLE 1. Studies on EMDR in the Treatment of Addiction

Study	Design	*N*	Addiction	PTSD/ Trauma Exposure	EMDR Interventions (Number of Sessions)	Other Interventions	Main Findings	Comments
Abel and O'Brien (2010) *Journal of EMDR Practice and Research*	Case report	1	Alcohol	PTSD/single trauma	AF-EMDR (DeTUR and CravEx) and TF-EMDR (3 years, weekly sessions)	AA visits	After 2 years, the patient was still sober and in treatment while PTSD was still in remission.	Typical example of untreated PTSD before referral. Nice demonstration of tailored integrated treatment of AF and TF-EMDR.
Bae, Han, and Kim (2013) *Journal of Gambling Studies*	Case series	4	Gambling	No comorbidity	AF-EMDR (DeTUR) (3 sessions)	10-Week inpatient program for gamblers	At posttreatment, self-reported gambling, urges, depression, anxiety, and impulsiveness were improved. All four patients maintained abstinence from gambling at six months follow-up.	Nice demonstration of DeTUR as an add-on treatment for behavioral addiction. This pilot study calls for an RCT.
Bae and Kim (2012) *Journal of EMDR Practice and Research*	Case report	1	Internet	None	AF-EMDR (DeTUR) (4 sessions)	None	After four sessions, the patient was able to restrict daily Internet use to 1 hour. These gains were maintained at 6- and 12-month follow-up.	Good results in four sessions of DeTUR as a stand-alone treatment in a mildly addicted 13-year-old boy without comorbidity.
Brown, Gilman, Goodman, Adler-Tapia, and Freng (2015) *Journal of EMDR Practice and Research*	Quasi-experimental	220	Various substances	150 patients with trauma history (criterion A) of whom 41% had PTSD	Voluntary TF-EMDR for patients with trauma in history (average 12 sessions, range 4–29)	Structured 12- to 18-month court program for convicts of nonviolent, drug-related crimes plus "seeking safety" groups for those with trauma history.	Patients who chose additional TF-EMDR after seeking safety ($n = 65$) graduated at a rate of 91%; those who declined ($n = 47$) graduated at 57%. Recidivism: 12% for patients who chose additional TF-EMDR, 33% for those who declined.	Voluntary T-trauma specific treatment seems to improve court program outcomes, even if symptoms are below PTSD-threshold.

(Continued)

TABLE 1. Studies on EMDR in the Treatment of Addiction *(Continued)*

Study	Design	*N*	Addiction	PTSD/ Trauma Exposure	EMDR Interventions (Number of Sessions)	Other Interventions	Main Findings	Comments
Cecero and Carroll (2000) *American Journal of Psychiatry*	Pre-post study	11	Opiates and cocaine	No data on traumahistory or PTSD	AF-EMDR (DeTUR) (3 sessions)	Methadone maintenance, urine screening and counseling.	The study dropout was high (7/11) especially in those with high cravings. 40% experienced a decrease in craving, 12% an increase. In the subgroup of completers (4), two showed a reduction in cocaine use, and one an increase.	The study suggests feasibility issues and perhaps limited effectiveness of AF-EMDR. However, the pre-post design and the small number of sessions limit conclusions.
Cox and Howard (2007) *Sexual Addiction and Compulsivity*	Case report	1	Sex	Sexual abuse in history, no PTSD	TF-EMDR (3–5 sessions) AF-EMDR: recent relapses (±3 sessions)	Individual session with psychoeducation and cognitive therapy. Weekly group sessions (12-step program for sex addicts)	After 15 sessions, the therapist ascertains substantial progress (no measures) regarding trauma treatment and relapse prevention.	The authors draw attention to the huge proportion of childhood trauma in sex addicts and demonstrate how EMDR can be integrated in addiction treatment.
Hase, Schallmayer, and Sack (2008) *Journal of EMDR Practice and Research*	RCT	34	Alcohol	Some patients with PTSD	AF-EMDR (CravEx): craving/relapse (2 sessions)	Two-week inpatient treatment as usual (TAU: detoxification, motivational interviewing, AF-group therapy)	At follow-up (1 month), patients allocated to TAU + EMDR had less craving, relapse and depressive symptoms than patients in TAU group.	The only RCT in this field. Very promising results, even after two sessions. However, study dropout was very high.
Henry (1995) *Journal of Gambling Studies*	Quasi-experimental	22	Gambling	18 patients with trauma history, no PTSD	TF-EMDR (±2 sessions)	Individual outpatient cognitive therapy	Patients receiving additional EMDR demonstrated—compared to not yet receiving EMDR—reduced gambling events, especially those with trauma history	This study suggests additional value of TF treatment in behavioral addiction, even in non-PTSD patients.
Kullack and Laugharne (2016) *Journal of EMDR Practice and Research*	Case series	4	Alcohol/ various substances	PTSD (single trauma in adulthood)	TF-EMDR (±6 sessions)	Patients were referred for PTSD; substance abuse worsened after the traumatic event. No additional treatment for the addiction	At 12-month follow-up, all patients reported a significant decrease in PTSD symptoms as well as in addictive behavior. Three patients no longer met criteria for substance use disorder.	This study describes four cases that support the self-medication hypothesis for the relationship of PTSD and substance use.

Marich (2009) *Journal of EMDR Practice and Research*	Case report	1	Various substances and sex	PTSD (sexual assault)	TF-EMDR (±15 sessions)	Eight-week detoxification program plus resuming contact with AA group and new AA sponsor	She was 3 months sober before the start of EMDR. At 18 months follow-up: complete sobriety and significant changes in functional life domains.	EMDR was not only directed toward relief of PTSD symptoms but to reprocess other self-image defeating memories.
Marich (2010) *Psychology of Addictive Behaviors*	Qualitative study	10	Various substances	Trauma history, not necessarily PTSD	TF-EMDR (Unknown number of sessions)	Women in long-term addiction, trauma, and mental health treatment on an outpatient basis, integrated with safe and affordable housing	The women were interviewed at least 6 months after EMDR therapy. As a whole, the participants judged EMDR as important in their addiction treatment	In line with self-medication hypothesis, patients said that it was important that EMDR helped them to access their core emotional issues that had prompted them to use drugs.
Miller (2010) Traumatology	Case report	1	Gambling	No data on trauma history or PTSD	AF-EMDR (FSAP): positive targets (so called feeling states) related to gambling (5 sessions)	No other interventions. No sobriety required. The patient may continue the behavior for further enquiry.	The number of hours playing poker went from 40 to less than 8 a week. After 3 months the patient played poker once or twice a week while doing well in job and marriage.	During reprocessing of a positive memory, it appeared that the positive feeling was to compensate for the belief "I am a loser." Feeder memories for this negative belief were also reprocessed
Miller (2012) *Journal of EMDR Practice and Research*	Multiple baseline study	4	Compulsive behaviors	No data on trauma history or PTSD	AF-EMDR (FSAP): positive targets (feeling states) related to compulsive behaviors (Unknown number of sessions)	No other interventions. No sobriety required. The patient continues the behavior for further enquiry.	All participants reported that their compulsive behavior was eliminated after the intervention. In three patients the link between the processing and reduced reactivity to the visualized behavior was demonstrated.	Nice example of multiple baseline design: two compulsive behaviors were treated in random order.
Perez-Dandieu and Tapia (2014) *Journal of Psychoactive Drugs*	Randomized pilot	12	Alcohol and/or drug dependency	PTSD	TF-EMDR (8 sessions)	Treatment as usual (TAU: medical care, medication, psychoeducational interviews, and social work)	Compared to TAU-only, the group with additional EMDR showed more reduction in PTSD and depressive but not addiction symptoms	This study demonstrates that a decrease in PTSD symptoms, depression and an increase in self-esteem can occur beyond abstinence.

(Continued)

TABLE 1. Studies on EMDR in the Treatment of Addiction *(Continued)*

Study	Design	*N*	Addiction	PTSD / Trauma Exposure	EMDR Interventions (Number of Sessions)	Other Interventions	Main Findings	Comments
Rougemont-Bücking and Zimmermann (2012) *Schweizer Archiv für Neurologie und Psychiatrie*	Case report	2	Opiates and benzo-diazepines	Complex PTSD and multiple trauma in history	TF-EMDR (4–5 EMDR sessions after extensive number of preparation and stabilization sessions)	Three to 9 months preparation and stabilization, psychosocial supportive treatment and methadone maintenance treatment	EMDR therapy was challenging but feasible, despite ongoing substance use. Trauma processing did not increase (but neither decrease) craving and substance use over time.	In severely damaged patients, EMDR is feasible; the patient does not need to be sober.
Shapiro, Vogelmann-Sine, and Sine (1994) *Journal of Psychoactive Drugs*	Case report	1	Opiates	Trauma history (physical/emotional abuse)	TF-EMDR AF-EMDR: triggers for relapse (Unknown number of sessions)	Individual outpatient treatment with trauma-, coping- and addiction-related goals	18 months sober after start of therapy. EMDR therapy seemed to have accelerated recovery from opioid addiction.	First case documentation of combining trauma treatment and treatment for addiction
Tsoutsa, Fotopoulos, Zakynthinos, and Katsaounou (2014) *Tobacco Induced Diseases*	Quasi-experimental	24	Tobacco	No data on trauma history or PTSD	AF-EMDR (FSAP): positive target or "feeling state" (6 sessions)	12 patients under went 6 sessions of the FSAP protocol. 12 other patients received 6 sessions of cognitive-behavioral therapy (CBT)	The groups were compared for smoking cessation (self-report questionnaire combined with CO-measurements). The EMDR therapy group had a success rate of 50% versus 25% for CBT.	No details on study design were disclosed in this meeting abstract.
Zweben and Yeary (2006) *Journal of Chemical Dependency Treatment*	Case report	2	Alcohol	Trauma history/PTSD	SPP, RDI, TF-EMDR: triggers (Unknown number of sessions)		The authors argue that EMDR therapy may provide a powerful addition to addiction treatment in traumatized patients.	

Note. PTSD = posttraumatic stress disorder; AF-EMDR = addiction-focused EMDR; DeTUR = desensitization of triggers and urge reprocessing protocol (Popky, 2010); CravEx = craving extinguished protocol (Hase, 2010); TF-EMDR = trauma-focused EMDR; AA = Alcoholics Anonymous; RCT = randomized controlled trial; TAU = treatment as usual; FSAP = feeling state addiction protocol (Miller, 2010); CO = carbon monoxide; SPP = safe place procedure (Shapiro, 2001); RDI = resource development and installation (Korn & Leeds, 2002; Leeds & Shapiro, 2000).

30 hours of treatment in 5 working days (Hendriks, de Kleine, van Rees, Bult, & van Minnen, 2010) with lower dropout rates. To our knowledge, intensive TF-treatment has not yet been described for addicted patients, but the first experiences in the first author's (WM) addiction clinic are promising.

With respect to the sequence of interventions, it was, until recently, believed that addiction treatment should precede trauma treatment; the patient should first reach abstinence before "digging up old pain." Most experts in the field today realize that this is often not feasible and stagnating treatment, and they suggest a blended or even reversed approach (Abel & O'Brien, 2010; Roberts et al., 2015; Shapiro et al., 1994).

Summarizing, although PTSD treatment in addicted patients can be challenging, it is feasible and safe, and a significant reduction of PTSD symptoms is to be expected. There is—at this moment—little evidence that trauma treatment will improve addiction outcomes, at least not in the short term. A final remark is that these conclusions are mainly based on TF-CBT; it is conceivable that the effects of EMDR are broader because the procedure is less TF and more directed toward generalization and integration. Voluntary and well-informed commitment as well as the provision of (integrated) intensive programs may increase treatment adherence and treatment outcomes. All authors in the field emphasize the low quantity and quality of existing research compared to the significance of this mental health condition.

Trauma-Focused EMDR in Addicted Patients Without Posttraumatic Stress Disorder

Negative life experiences might underlie a wide range of comorbidity in addiction—not only PTSD—such as depression, phobia, social, and personality problems. Gielen, Havermans, Tekelenburg, and Jansen (2012) found that up to 97.4% of patients that presented themselves for addiction treatment had previously experienced *DSM-IV* criterion-A life events, whereas "only" 36.6% of them had a *DSM-IV* diagnosis for PTSD. However, obvious the relationship between addiction and trauma exposure may be, it is not self-evident that trauma treatment is necessary or even helpful in these cases. To put it even more strongly, sometimes the therapist and the patient both have the impression that working through the "old stuff" is very useful; the patient may even note that this is "the core of the problem, where it all begun, and what it is all about," but at the same time, working on these painful memories may also help to avoid an even more difficult or painful part for the addicted person: ceasing the behavior. On the other hand, the approach is obvious: Addiction can be seen as a way to avoid or cope with negative emotions, emotions that are—according to the AIP model—maintained by dysfunctional stored negative learning experiences. As an alternative for affect management and coping skills training—a common element in CBT programs for addiction—one can try to diminish the negative emotions themselves by reducing the impact of the associated memories. Ideally, after TF-EMDR, there is little left that needs to be so vigorously avoided or suppressed. However, the same line of reasoning holds for PTSD in addiction (i.e., the self-medication hypothesis) and treating the PTSD appeared to have disappointing effects on the addiction itself, even if applied alongside an addiction treatment.

Studies that used TF-EMDR in patients without a full PTSD diagnosis are also included in Table 1. The general picture that emerges from these studies is fairly positive, not only regarding trauma symptoms, therapy satisfaction, and treatment completion but also regarding addiction related outcomes, such as craving, time to relapse, and abstinence rates (Brown et al., 2015; Cox & Howard, 2007; Henry, 1995; Marich, 2010; Shapiro et al., 1994; Zweben & Yeary, 2006). Unfortunately, the quality of the research prohibits clear conclusions.

Given the weak empirical evidence, history taking and case conceptualization seem all the more important when indicating TF-EMDR. In the case of PTSD there are good reasons to start with TF treatment as soon as possible. For non-PTSD patients in whom—for example in the behavior analysis—the addictive behavior serves to avoid trauma-related affect, TF-EMDR may also be indicated. That is, alongside AF interventions, as has been done in the majority of the studies on TF-EMDR in non-PTSD patients mentioned in Table 1.

Current Status of Addiction-Focused EMDR

The case conceptualization of the addicted person often demonstrates the significance of specific addiction-related symptoms, emotions, and memories, such as intense craving, fear of relapse, pleasant memories of drug use, or a general sense of helplessness toward the addiction. The reprocessing of addiction-related memory representations has been subject to many attempts to help people to overcome their addiction, the smoking cessation protocol of Popky being the very first publication (Popky, 1992). AF-EMDR protocols have been used as an adjunctive,

"add-on" treatment (e.g., Bae, Han, & Kim, 2013; Hase et al., 2008) or as a "stand-alone" addiction treatment (e.g., Bae & Kim, 2012; Miller, 2010, 2012). Most approaches are directed toward mitigating craving; craving defined as an intense desire to consume a substance or to perform a specific behavior. Craving is a key concept in addiction, it might suddenly and unexpectedly be triggered, and it is an important reason for the difficulties that addicted people experience when they try to stop their addictive behavior, how well prepared and motivated they are. It is also considered an important factor in relapse.

Popky (2005, 2010) described his approach in the desensitization of triggers and urge reprocessing (DeTUR) protocol, which he considers as adjunctive to a broader treatment plan for substance use disorders and other problem behaviors such as compulsive eating. For a comprehensive outline of this protocol, see Popky (2010). Popky emphasizes the need to enhance access to a positive internal state by identifying and associating it with a positive treatment goal (PTG) in which abstinence is implied. The DeTUR protocol then focuses on present triggers that induce craving. The DeTUR uses the level of urge (LoU) scale, which represents a Likert-type scale otherwise identical to the Subjective Units of Disturbance (SUD) scale. After the memory representations of the trigger image is fully desensitized (LoU = 0), it is coupled to the positive state of the treatment goal (with the anchor and bilateral stimulation [BLS]), resembling counterconditioning from learning theory. Although several case studies have been published (see Table 1), thus far no controlled research has been done using the DeTUR protocol.

Hase (2010) described his approach in what he called the craving extinguished (CravEx) approach. He recognized that trauma is one of several possible routes leading to addiction, but that every addiction has developed a life of its own, with according memory representations. CravEx focuses on this "addiction memory" (Boening, 2001; Müller, 2013), a memory network thought to be composed of addiction-related memories of loss of control and a substance-specific memory representations of the substance. The CravEx protocol follows the three-pronged approach (Shapiro, 2001) whereby past memories of relapse (first, worst, most recent) and craving (first, worst, most recent), present triggers, and future fears are identified and desensitized with EMDR (see Hase, 2010, for the full protocol). A subset of the CravEx protocol (desensitization of memory representations of relapse and intense craving) has been used in a randomized clinical trial (Hase et al., 2008; see Table 1)—thus far the only RCT regarding EMDR in addiction. There were 34 chronic alcohol-dependent patients receiving inpatient, regular TAU participated. They were randomly assigned to TAU only or TAU + two 1-hour sessions of EMDR. Posttreatment and follow-up results were very positive for the EMDR group: they experienced less craving and had lower relapse rates. With only two additional EMDR sessions, these outcomes are almost too good to be true and need replication, especially because the high study and treatment dropout, and the fact that the researcher was also the therapist.

A different approach by Knipe (2010), in his work on dysfunctional positive affect, provides additional strategies when targeting addictions with EMDR therapy. This approach may be particularly useful to target ambivalence regarding treatment goals because positive aspects of the behavior may overshadow the wish for behavioral change. Knipe (2010) uses the Level of Positive Affect scale (a Likert-type scale ranging from 0 to 10) or Level of Positive Affect (LoPA) as a supplement to the SUD scale and LoU scale. Unfortunately, despite several appealing case descriptions (Knipe, 2005), this approach has not been evaluated in research yet.

Miller (2010), likewise, focuses on dysfunctional positive affect in his feeling-state addiction protocol (FSAP). He posits that strong positive experiences can become associated with certain behaviors and that addictions are subsequently driven by the desire to reexperience these positive states by means of reengaging in the addiction behaviors. The FSAP starts with the identification of the most positive aspects of a problematic behavior. Subsequently an affect bridge is used to identify memories that are representative for the coupling of the problem behavior and the underlying healthy need. During desensitization of these memories, associated negative associations that may have contributed to unfulfilled needs or a negative self-image may arise. Emerging negative material can be treated subsequently with the standard EMDR protocol. Miller (2012) has conducted a multiple baseline study in four patients with each at least two treatment-resistant compulsions or behavioral addictions. All four participants demonstrated a significant decrease in the specific behavior that was targeted. Positive results for the FSAP were also published in a Dutch case report of a patient suffering from exhibitionism; the positive feeling state was represented by an image in which a woman startled and the patient was feeling powerful (Ten Hoor, 2014; in Dutch, therefore not included in Table 1). A replication of these findings by others and more controlled research is needed.

Taken together, AF-EMDR protocols (Hase, 2010; Knipe, 2010; Miller, 2010; Popky, 2010) reflect interesting albeit different and sometimes partly overlapping approaches. A few more approaches have been described, but the procedure or case description was not detailed enough to be included in Table 1 (Barbieri, 2008; Omaha, 1998). The current state is that the literature is promising for substance use disorders as well as behavioral addictions (see Table 1). Empirical evidence is weak, however, even though the different protocols exist a while and are widely used. Almost without exception the protocols have been developed by expert clinicians, without much opportunity to initiate research.

On the other hand, a growing body of laboratory research (not mentioned in Table 1) on imagery, craving, and eye movements add to the positive clinical experiences. Well-controlled studies show that eye movements (and other dual tasks) lead to decreases in image vividness and craving in, for example, food-related imagery (Littel, van den Hout, & Engelhard, 2016). In this study, the intervention even affected behavior: subjects in the eye movement's condition were more inclined to choose healthy over unhealthy snack options. For an overview of relevant experimental research, see Markus, de Weert-van Oene, Woud, Becker, and De Jong (2016).

In conclusion, both clinical and laboratory data suggest that EMDR can be useful to reduce intensity of substance-related imagery and craving and might be a valuable intervention in addiction treatment.

New Possibilities in Addiction-Focused EMDR

In recent years, an increasing number of studies have been published in favor of the working memory theory (Andrade, Kavanagh, & Baddeley, 1997). At this moment, it seems to provide the best explanation for the effects of eye movements in desensitizing and reprocessing negative memories. Other mechanisms may add to the effects of eye movements, but the empirical evidence for other possible working mechanisms is much smaller and the contribution (explained variance) to the effectiveness is probably much lower as well. We will briefly summarize the working memory theory, including its significance for EMDR, because it generates several new possibilities for EMDR, not least for AF-EMDR. The theory and the new possibilities have already been described for Dutch therapists (Hornsveld & Markus, 2016a) and are included in the list of potential EMDR interventions (Table 2).

The theory underpinning the working memory model states that recalling a memory taxes working memory capacity, which in itself is limited (Baddeley, 2012). Because a traumatic memory is inherently intense, vivid, and emotionally charged, it loads particularly strong on the working memory when recalled. So if a concurrent task loads on working memory (such as eye movements; Gunter & Bodner, 2008) is executed during recall, it competes for resources with the recalled memory representation. As a result, the vividness and emotionality of the memory is reduced (e.g., Andrade et al., 1997; de Jongh, Ernst, Marques & Hornsveld, 2013; Gunter & Bodner, 2008; Maxfield, Melnyk, & Hayman, 2008). The desensitized and reprocessed memory representation is then reconsolidated in long-term memory, in a less disturbing format.

Consistent with this theory, memories have been found to becoming less disturbing, and less vivid, not only during execution of bilateral eye movements (e.g., Gunter & Bodner, 2008) but also during a range of other nonbilateral working memory taxing tasks (for an overview, see van den Hout & Engelhard, 2012). Four main clinical implications derive from this line of research: regarding positive memories, negative flash-forwards, positive flash-forwards, and resource installation procedures.

EMDR and Positive Memories. The working memory account predicts that positive memories and images will also become less vivid and less positive when recall is paired with simultaneously horizontal eye movements (or any other task taxing working memory) being performed. Five studies compared eye movements with no eye movements in positive memories and confirmed this hypothesis (Barrowcliff, Gray, Freeman, & MacCulloch, 2004; Engelhard, van Uijen, & van den Hout, 2010; Hornsveld et al., 2011; van den Hout, Muris, Salemink, & Kindt, 2001). One study conflicted with this prediction (Keller, Stevens, Lui, Murray, & Yaggie, 2014). In general, positive memories become less positive when retrieved following the application of eye movements. Because episodic positive memory representations (e.g., the vivid memory of a first shot of heroin, or the positive memory of being "one of the boys" while drinking) play a central role in craving and the maintenance of addiction (Müller, 2013), it is proposed that EMDR therapy on positive touchstone memories can be a promising adjunct to current treatment options. Note that working memory theory predicts that every positively emotionally charged memory will become desensitized by eye movements (or any other dual task) regardless whether the memory is dysfunctional or not, whereas the AIP model assumes that only dysfunctional memories will resolve (cf. Knipe, 2010, for disfunctional positive affect. Unfortunately, this prediction has not yet been object of study, as far as we know.

TABLE 2. Palette of EMDR Interventions in Addiction: Overview of Interventions

Aims	No.	Intervention	Main Indication(s)	Source, Further Reading	Key Instructions and Questions
Resourcing Increasing safety, strength, and accessibility of resources	1	Safe place and resource development installation	Need for preparation, enhancing skills, and resources to handle forthcoming difficult situations	Shapiro (2001) Leeds and Shapiro (2000) Korn and Leeds (2002)	*Please bring up an image of a place that feels safe and calm.* *When you think about this [challenging] situation, what qualities, resources or strengths are you missing? Think of a time when you felt* [i.e., strong, confident, soothed, able to tolerate your feelings].
	2	Installation of positive treatment goal	Insufficient availability of a motivating, achievable, personal goal	Popky (2010)	*What really motivates you to reduce/stop using/doing* [name substance or behavior]? *What is your dot on the horizon?*
TF-EMDR Reducing the impact of the past	3	EMDR on memory representations associated with PTSD (T-traumas)	PTSD symptoms	Shapiro (2001)	*Which images are the most intrusive?*
	4	EMDR on memory representations fueling negative affect and affect intolerance (ACEs, t-traumas)	Addiction conceptualized as self-medication strategy	Shapiro (2001) Brown et al. (2015) de Jongh et al. (2010; two-method approach, Approach 1)	*What is the most difficult situation for you when it comes to resisting using/doing* [name substance or behavior]? Further questioning by either affect bridging or Method 1 of "two-method approach"
	5	EMDR on memories fueling negative core beliefs (ACEs, t-trauma)	Addiction conceptualized as maintained by low self-efficacy/low self-esteem	de Jongh et al. (2010; two-method approach, Approach 2)	*If you can't resist a difficult situation, what words express your negative belief about yourself?* [self-defeating conviction] *What experiences provide the strongest "proof" for this self-defeating conviction?*
AF-EMDR Reducing the impact of change-blocking fears	6	EMDR on negative flash-forwards of prolonged abstinence	Fear of sobriety	Hornsveld and Markus (2016b) This article	*What negative associations do you have with prolonged abstinence?*
	7	EMDR on negative flash-forwards of relapse	Fear of relapse	Hornsveld and Markus (2016b) This article	*What catastrophic image comes up when you think about relapse?*
	8	EMDR on memories of relapse	Feeling of powerlessness in the face of the addiction	Hase (2010)	*What first/worst/last memories you have regarding* relapsing *with* [name substance or behavior]? *What other first/worst/last memories you have whereby you* clearly lost control *over using/doing* [name substance or behavior]? *What other experiences provide the strongest* "proof" that you cannot handle *using/doing* [name substance or behavior]?

AF-EMDR Reducing the attractiveness of the addictive behavior	9	EMDR on memories of craving	High levels of craving and corresponding relapses	Hase (2010)	*What first/worst/last memories of craving/the urge to* [name substance or behavior]?
	10	EMDR on positive memories	Patient wants to reach an unrealistic or dysfunctional goal.	Miller (2010) Knipe (2010)	*What is your first/most intense/last positive or craving-inducing memory you have regarding previous experiences with using/doing* [name substance or behavior]?
	11	EMDR on memories linking substance or behavior with underlying healthy needs	The addictive behavior is linked to the healthy need.	Miller (2010) Knipe (2010)	Miller's approach: *What underlying healthy need is linked to* [name substance or behavior]? Knipe's approach: *What underlying healthy need does using/doing* [name substance or behavior] *fulfill?*
	12	EMDR on positive flash-forwards about "dry use"	Desire thinking, craving	Hornsveld and Markus (2016b) This article	*What is the most appealing aspect of using/doing* [name substance or behavior]?
	13	EMDR on positive flash-forwards about desired goal	The substance or the behavior itself is attractive	Hornsveld and Markus (2016b) This article	*What is the most desired* goal *you want to achieve with using/doing* [name substance or behavior]?
AF-EMDR Increasing stability of treatment effects	14	Desensitization of trigger situations	Present situations that trigger craving	Hase (2010) Popky (2010)	*During which regularly occurring circumstances or mood states can you resist using/doing* [name substance or behavior] *the least?*
	15	Future templates and mental videos	Present situations that are triggers for relapse	Hase (2010) Shapiro (2010)	*Imagine yourself coping effectively with* [name substance or behavior] *in the future.*

Note. TF-EMDR = trauma-focused EMDR; PTSD = posttraumatic stress disorder; ACEs = adverse childhood experiences; AF-EMDR = addiction-focused.

EMDR and Negative Flash-Forwards. Many patients are tormented not only by images and thoughts of past aversive events (stored in autobiographical retrospective memory) but also by disturbing images and thoughts about possible future events, for example, in anxiety disorders, hypochondriasis and depression. Such future-oriented images and thoughts—or memory representations—can take the characteristics of flashbacks: intrusive, emotionally charged, and something to avoid. Working memory theory suggests that flash-forwards (but also other emotionally charged fantasies; e.g., what *could* have happened in an event that, in fact, ended well) can be stripped of their emotional impact with EMDR in the same way as flashbacks. Several studies provide support for this (Engelhard et al., 2011; Engelhard, van den Hout, Janssen, & van der Beek, 2010).

The scope of flash-forwards in case conceptualizations should not be underestimated (Logie & de Jongh, 2014). Furthermore, flash-forwards are not to be confused with "future templates," which are visualizations of successfully managing an anticipated future event. Flash-forwards, in contrast, are visualizations of catastrophes or worst-case scenarios. They are unrealistic, either because the image is far too negative, and/or the probability that the event will actually occur is grossly overestimated. The procedure of treating flash-forwards with EMDR has been well described by Logie and de Jongh (2014).

Based on clinical experience, we identified two kinds of negative flash-forwards in addiction that may add to the difficulties addicts experience to break with their dependency: flash-forwards of abstinence and flash-forwards of relapse. In other words, we argue that both the fear of abstinence and relapse may be driven by emotionally charged repellent images and interfere with therapy goals. Both kinds of negative flash-forwards are included below in the list of possible EMDR interventions for addiction.

EMDR and Positive Flash-Forwards. It has never been subject of experimental research, but if eye movements can desensitize positive memory representations as well as negative future-oriented images, it is likely that eye movements can be deployed to desensitize positive flash-forwards as well! Many patients experience vivid, intrusive imagery, and perseverative thoughts regarding substance use, called "desire thinking" or "dry use" (Caselli & Spada, 2015). It escalates craving and drives to subsequent substance use. Thus, the memory representations corresponding to the concept of "desire thinking" can be conceptualized as a positive flash-forward of imminent use. Positive flash-forwards not only pertain to substance use: images of winning the jackpot, shopping, eating, or starting a fire may—when activated—cause cravings and associated behavior in susceptible persons. Although the role of intrusive imagery in craving is documented for addiction (Caselli & Spada, 2015), the phenomenon has never been subjected to direct therapeutic intervention, only indirect as a phenomenon to be reckoned with by self-control techniques.

It is obvious that not all positive flash-forwards have to be desensitized: positive flash-forwards are important contributors to healthy behavior: images of being a licensed physician; to be a father, to enjoy a beer, or to have a house of your own, are powerful motivators for behavior. However, when positive flash-forwards seem to guide behavior in the wrong direction, it becomes interesting to apply EMDR therapy and desensitize these positive images. On the other hand, whenever there seems to be a *lack* of powerful healthy positive flash-forwards, it may be worth to install or strengthen them, and this is exactly one of the interventions of Popky's (2010) DeTUR protocol: the installation of a healthy PTG (see in the following text).

EMDR and Resource Installation Procedures. Several procedures use imagery in combination with eye movements to strengthen or increase accessibility of positive capacities or resources, such as the safe place procedure (SPP; Shapiro, 2001), resource development and installation (RDI; Korn & Leeds, 2002; Leeds & Shapiro, 2000) and the PTG (Popky, 2010). They are widely viewed as effective interventions, and have become an integral part of EMDR therapy and the DeTUR protocol. Despite its widespread use, no research has been performed to demonstrate the effectiveness of these interventions as separate procedures, nor has the additional value of eye movements been established. Reviewing the evidence for the desensitizing effects of eye movements in positive material, Hornsveld, de Jongh, and ten Broeke (2012) recommend being very cautious with eye movements in memory content that is aimed to be strengthened. Apart from theoretical and empirical considerations, clinical practice already seems to have changed to slower eye movements and to alternative BLS, like tapping or tactile "buzzers" to gain a maximum effect. Slow eye movements diminish the potentially fading effects of simultaneously performing tasks, and it is conceivable that a small distracting task helps patients to concentrate or to relax.

Apart from the controversy about the use of eye movements in imagery, the evidence for imagery as a therapeutic technique in a wide range of disorders

is growing. Strengthening positive resources, for example in competitive memory training (COMET), a technique quite similar to RDI but without eye movements (Korrelboom, Maarsingh, & Huijbrechts, 2012) has gained empirical evidence especially for increasing self-esteem. In addicted patients, self-esteem is often notoriously low, which may either reflect a premorbid risk factor and/or a consequence of the addiction. Increasing the strength and accessibility of functional positive material may be a welcome addition to existing treatment opportunities.

As a result of the working mechanism research, therapists—at least in The Netherlands—have become more careful with slow eye movements, tapping, clicks, buzzers and other low-effort tasks when the objective is to desensitize and reprocess (highly) emotional material. Not only because of the working memory theory but also the application of eye movements at normal speed and frequency is still the only evidence-based application of EMDR therapy. From a working memory perspective, the higher the SUD, LOU, or LOPA, the more important it seems to choose a dual task that can rival with the intensity of the memory representation. In many cases, the rival task will be eye movements at a speed as high as the patient can tolerate. The bilateral nature of the dual task is probably of less importance than its property to distract the attention from the intrusive memory while reprocessing.

Overview of Potential EMDR Interventions

Table 2 summarizes 15 EMDR interventions or modules which can be used in addiction, chosen based on existing protocols, theoretical considerations, and clinical experience. It is not meant as a new protocol, nor is it evidence based; it is rather a palette of opportunities where therapists can choose from, depending on history taking and individual case conceptualization. It can also provide guidance for experimental component research to determine which interventions are potentially effective, and which are not. Previous versions of this overview have been published as a book chapter (Markus & Hornsveld, 2015); as the palette of EMDR interventions in addiction (PEIA; Hornsveld & Markus, 2016a) and have been presented at EMDR Europe conferences (Hornsveld & Markus, 2014; Markus & Hornsveld, 2016). A subset of the interventions (Modules 2, 4–8, 10, 14, and 15) is currently being tested in a large RCT at IrisZorg addiction care, The Netherlands (Markus et al., 2015). Another subset (Modules 7, 10, 12, and 14) has been used in a case report on the treatment of a woman with gamma-hydroxybutyric acid (GHB) addiction (Qurishi, Markus, Habra, Bressers, & De Jong, 2017). Conceptually, all targets for EMDR therapy can be summarized in a model as presented in Figure 1. Table 2 shows the corresponding interventions.

How to Use the Palette of EMDR Interventions in Addiction

The set of modules included in the PEIA has been selected based on existing literature, theoretical considerations, and clinical experience. Only TF-EMDR for the treatment of PTSD (Module 3) is evidence based; none of the other modules has been examined as a single intervention for addiction, nor in conjunction with one another. This means that the clinician should not trust on these modules as independent treatment options for addiction; he or she may choose the modules alongside addiction-treatment according to prevailing guidelines. Often times, patients were referred to us when they relapsed after initial successful therapy, or when treatment got stuck. The EMDR modules were then offered in combination with resuming or continuing already acquired self-control skills.

EMDR in addiction starts with explaining and asking commitment on certain rules about transparency (regarding craving, use, and behavior), attendance, and refraining from substance use before and directly following sessions. We do not demand long-term abstinence beforehand. A pragmatic approach might be therapist and patient agree on a minimal set of rules: (a) no substance use before EMDR therapy (no session if clearly intoxicated), (b) openness regarding craving and substance use between sessions (so that new targets can be identified and coping strategies discussed), and (c) no substance use immediately following EMDR therapy (to avoid direct association of the two) and showing commitment to try out alternative strategies discussed during treatment. In our experience, this approach is feasible and, in most cases, does not seem to interfere with target activation and desensitization while treatment seems to be as effective.

Treatment goals (e.g., controlled use or prolonged abstinence) may vary and are noted without much discussion (but see Module 6). Table 2 outlines the main indications for each module and summarizes key instructions and questions for each module. All modules will be described in more detail in the following text. Worksheets and script notes can be downloaded from the Internet (Hornsveld & Markus, 2016b).

Choosing the Correct Module

Our experience is that it can be hard to determine on beforehand which modules are useful in a specific

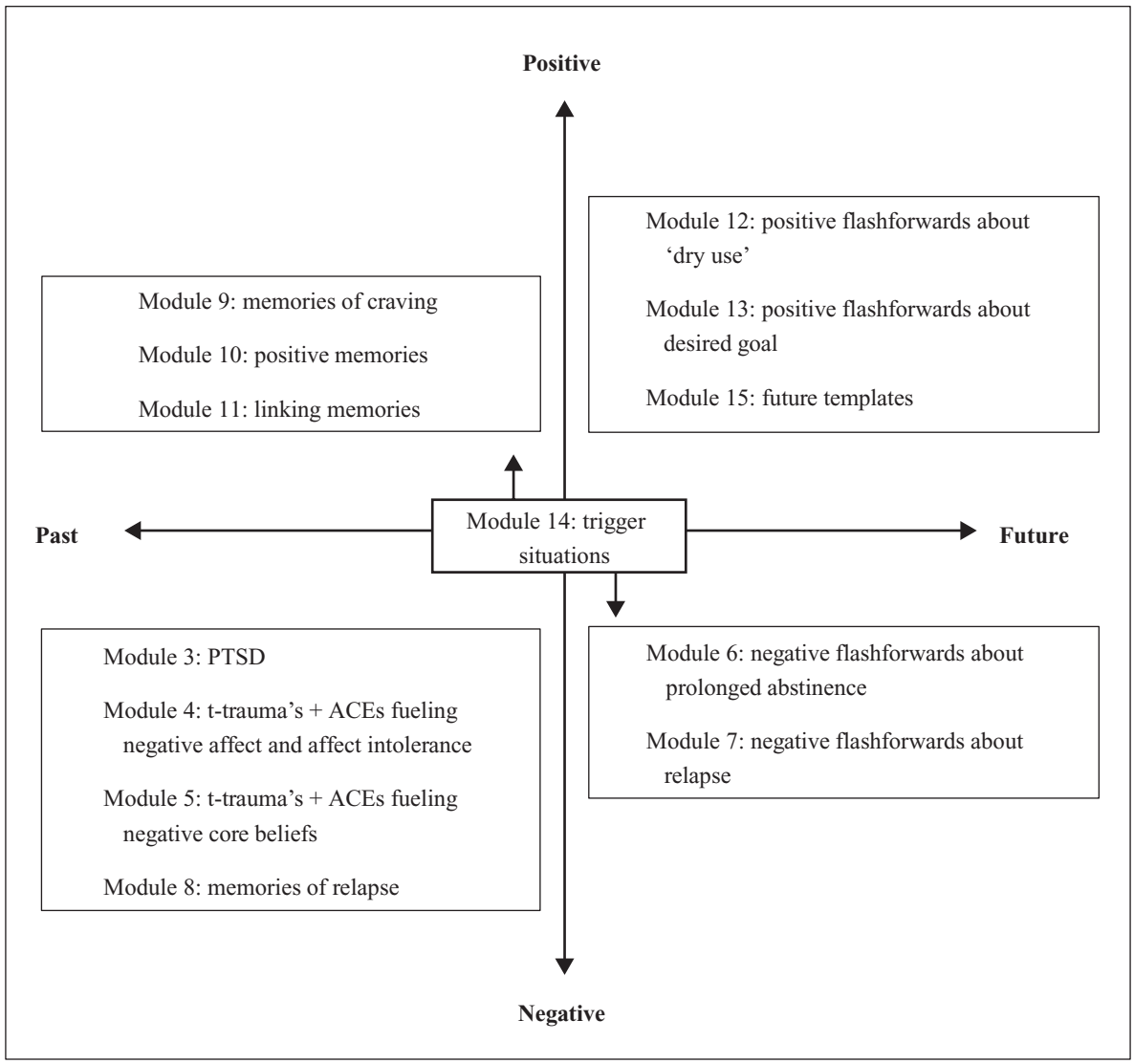

FIGURE 1. Conceptual overview of the PEIA modules. The modules can be distributed on two axis: one for time (past - present - future) and one for valence (positive or negative). Trigger situations are represented in the middle of the figure (the present), but can be associated with either a positive or negative charge.

patient and which are not. Careful history taking with an emphasis on the factors that contributed to the addiction and factors that maintain the behavior is a prerequisite for a good understanding and case conceptualization of the problem behavior. In addiction, this will be an ongoing process. However, history taking does not always reveal specific vulnerabilities because EMDR therapists will recognize from their trauma patients. It may well happen that a patient says he or she has come to terms with a traumatic experience, but when the therapist proposes to take it to the test (by starting the EMDR protocol), the SUD may show a remarkable rise, suggesting more unresolved pain than the patient was aware of, or was able to report in an interview situation.

For example, one patient seemed strongly motivated to stop drinking and stay abstinent (no obvious indication for Module 7, flash-forward of abstinence); he had a clear PTG (i.e., no obvious indication for Module 2), but nevertheless, after a while, it appeared that he avoided social meetings and that he had a (consciously ignored) doom scenario about abstinence that coexisted with his wish to quit drinking. The doom scenario consisted of an image of future social meetings without "booze" ("parties are no longer enjoyable"). The therapist decided to apply Module 6 (among others) to give him a more realistic image of social meetings and to stimulate him to visit parties again.

For first-time users of the PEIA, we recommend to consider all addiction-focused modules during

assessment. When in doubt, the target selection phase of the module can be started. When a module does not generate relevant targets (no images or no SUD, LOPA, or LOU) the focus can shift to the next module. To enhance commitment, the order and relevance of the goals to achieve should be based on shared decision making.

Specific indication criteria are given below for each module separately. In general, when the person is ambivalent about his behavior and has difficulties to stay motivated Modules 1, 2, 6, 7, and 8 may be helpful. It is important that the therapist tailors the treatment to the motivational state of the patient (O'Brien & Abel, 2011). A phased approach has been propagated to guide clinical decision making using the stages of change model, which reflects how people progress as they engage in behavior change (Prochaska & DiClemente, 1982, 1992). Although we subscribe to the idea that the motivational state should always be taken into account when tailoring treatment, research suggests that motivation is a highly dynamic phenomenon (Hughes, Keeley, Fagerstrom, & Callas, 2005). So a phased approach may be too inflexible to guide clinical practice. Instead, we propose tailoring the treatment by assessing the motivation on a session-by-session basis. When there are clear deviations in motivation from the previous session, this should be discussed and a shared decision should be made on how to proceed. For instance, a patient can become very demotivated after a relapse between sessions. This may be fueled both by an overwhelming sense of powerlessness (indication for Module 8: memories of relapse) and by a fear of further relapse in the coming time (indication for Module 7: negative flash-forwards of relapse). This should be addressed first before proceeding with the planned intervention (e.g., desensitizing trigger situations, Module 14).

When the person suffers from affect fluctuations, affect phobia, or other affect management problems, especially when the addiction seems to serve to regulate the affects, TF-EMDR, that is, modules (3, 4, and 5) may be considered. In the case of PTSD, it is recommended to start TF-EMDR as soon as possible. When craving is a problem, and this may often be the case, all modules aimed at reducing the attractiveness of the behavior may be relevant (Modules 9–13). For relapse prevention Modules 14 and 15 are indicated.

In all cases, general therapeutic and EMDR therapy skills are required, especially during the desensitization process, when the patient gets stuck, loops, abreacts, or when other painful memories open up. Cognitive interweaves are often necessary to help patients during reprocessing.

Module 1: Safe Place Procedure and Resource Development Installation

The SPP (Shapiro, 2001) and RDI (Korn & Leeds, 2002; Leeds & Shapiro, 2000) hardly need explanation. When needed, these interventions can be used at any time and in any disorder, including addiction disorders, for example, resourcing firmness to remain steadfast in a difficult (trigger-)situation, between sessions or to bring oneself in a desired state of mind (e.g., relaxed, calm) that otherwise is pursued by using a substance or demonstrating the addictive behavior. As explained in the preceding text, we recommend very slow eye movements or another low-taxing dual task in this case.

Module 2: Installation of a Positive Treatment Goal

"Installing" a PTG (Popky, 2010) seems especially valuable in patients whose life has become governed by the addiction. These patients are motivated to "stop" and "get rid of the negative consequences" but have little idea how life can be without addiction; they do not have a dot on the horizon to focus on. A middle-aged woman, for example, pictured herself in a zoo with her grandchildren, who were not allowed to stay with her as long as she could not abstain from alcohol. This clear, feasible, attractive image and associated positive state helped her to keep motivated. In line with Popky (2010), the positive state was subsequently linked to desensitized trigger situations to further increase feelings of mastery.

Experts differ in the importance given to resource building in addiction (Modules 1 and 2). Popky (2010), in his latest version of DeTUR, places strong emphasis on positive and empowering interventions, especially in the first phase of therapy. He starts with the question "What do you like and do best?" (installing the answer with eye movements) and continues with physically anchoring a true "positive treatment goal." He then moves on with the identification and desensitization of triggers for urge. He only works with the past "when it opens up." His idea is that with the desensitization of triggers and installation of the positive, the patient's ego strength grows to "a point where threads open leading back to core issues, if they arise . . . " (p. 490). Other experts tend to indicate using TF-EMDR and in an earlier stage, especially with comorbid PTSD.

Module 3: Trauma-Focused EMDR for Comorbid Posttraumatic Stress Disorder

We recommend using TF-EMDR when the presenting addiction is comorbid with PTSD (see Figure 1).

PTSD and other comorbidities in addiction are easily overlooked (Gielen et al., 2012) or can only manifest during the recovery, making assessment in addiction a continuous process. In patients with comorbid PTSD, the approach is essentially standard EMDR therapy as early as possible. The aim is not to reduce the addiction in the first place, but to treat the PTSD, preferably alongside or integrated with addiction treatment. Substance use is no longer considered an absolute contraindication for TF-treatment (Van Minnen et al., 2012); only a factor to be taken into account and requiring good cooperation with the patient and expertise of the therapist in both addiction and trauma. The idea that trauma-work should be postponed until patients are stable and have reached a considerable period of abstinence is often not feasible, and is now outdated.

Module 4: Trauma-Focused EMDR for Emotional Problems in Patients With Addiction and Without Posttraumatic Stress Disorder

This module pertains to standard TF-EMDR therapy with respect to negative life experiences (ACEs, t-traumas) that are thought to have contributed to present emotional problems (e.g., anxiety, depression), but not directly to PTSD. EMDR will only have an effect on the addictive behavior itself, if these traumatic experiences are still fueling the emotional instability of the patient and if this instability is supposed to maintain the addictive behavior. In other words, the treatment plan is based on the self-medication hypothesis (Khantzian, 1985). Brown's findings (Brown et al., 2015) are positive for TF-EMDR in patients with a history of trauma exposure, both on the addiction as well as on the comorbid emotional problems. Individual therapist can include this module in their treatment plan, when the behavioral analysis of the addiction predicts that the addiction serves to regulate emotional problems and that this can be repaired by TF-EMDR.

Module 5: Trauma-Focused EMDR for Patients With Debilitating Negative Core Beliefs

This module describes a method called "from core-beliefs to targets" (de Jongh, ten Broeke, & Meijer, 2010), for complex case conceptualizations. It assists in identifying relevant targets for EMDR, especially when there seem to be too many traumatic memories from which to select targets. Which ones are the most relevant? The method provides a reasonable alternative when the methods of "affect-scan" or "floatback" seem to get a bit random. It is especially indicated when the symptom pattern of the addicted person seems to be driven by a negative core belief: a dominant belief about how the world works and who he or she is, rather than by specific emotional problems. Core beliefs generate affective and behavioral responses, which in turn contribute to new experiences that appear to confirm the cognitive bias: a vicious circle, hard to escape from. In addicted patients, low self-efficacy is known to be a significant predictor for relapse and usage (Adamson, Sellman, & Frampton, 2009); self-efficacy being defined as the extent or strength of one's belief in one's own ability to perform a certain behavior in specific circumstances sometime in the near future (e.g., to be able to refuse a drink when offered). Low self-efficacy is self-perpetuating: it contributes to relapse, while relapse itself contributes to a further decrease in self-efficacy. The relevant core belief that accompanies a low self-efficacy might be formulated by the individual as "I am incompetent," "I am weak," or "I am powerless." Often times, these core beliefs existed before onset of the addiction; they actually seem to have added to the development of the addiction. Learning theory and the AIP model (Shapiro, 2001) assume that dysfunctional beliefs about oneself (e.g., "I am a bad person"), or the world ("The world is a dangerous place"), or the capacity to handle difficult situations ("I am a weak person") are the resultant of multiple negative events. People are not born with negative core beliefs or a low self-efficacy. Because of the quantity of events that have contributed to a dysfunctional belief, it may be efficient to use the core belief to identify the most relevant memories to be processed with EMDR (de Jongh et al., 2010). In short, this method involves the following: (a) identifying the dysfunctional belief that is consistent with the patient's problems. The dominant and most relevant core belief in addiction is often the one that contributes most to the low self-efficacy although other core-beliefs might be identified as more relevant to the maintenance of the addiction, (b) identifying experiences that have led to the formation of and perpetuation of this belief and (therefore)—so to speak—"prove" that the belief is true, and (c) "discredit" this "evidence" with EMDR. For a full understanding and description of this method see de Jongh et al., 2010, and see PEIA; Hornsveld and Markus, 2016b, for this procedure tailored to addiction.

The method "from core-beliefs to targets" is primarily used to treat more severe forms of pathology, such as severe social phobia, complex PTSD, and/or personality disorders. The method is not evidence based for addiction, nor for other disorders, but clinical practice seems promising.

Module 6: Addiction-Focused EMDR on Negative Flash-Forwards of Prolonged Abstinence

One of the first goals in AF-EMDR is to reduce the impact of change-blocking fears or beliefs. Two fears are typically reported in addiction: the fear for prolonged abstinence (this module) and the fear for relapse when abstinent (next module). When these fears seem to hinder progress, they can best be tackled at an early stage of therapy.

It is not uncommon that patients—also when they are motivated to stop—have strong negative associations with abstinence. They fear for example, that they will experience a boring life without thrills, constantly fighting cravings, losing their friends, and struggling to avoid temptations. That perspective is not only discouraging; it is also not realistic in that extent; it sometimes seems to have developed during the addiction to justify one's behavior.

Because a flash-forward refers—by definition—to an overvalued image of the future, the negative self-referring cognition is something like, "I can't stand it," "I don't want to look at it," or "It is unbearable to think of." The desired positive change and ultimate statements (PCs) go—as a consequence—something like, "I can handle it," "I can look at this doom scenario since it is not realistic," "I am the one to make sure that this will not happen," or "I am in control of my life." Often, we observe that the original flash-forward fades out, to make room for a more realistic picture of the future.

Asking for the negative cognition (NC) as it is done in the standard EMDR protocol, "What words go best with the picture that express your negative belief about yourself now?" is often confusing or is not very helpful to activate the full impact of the flash-forward. We therefore ask, "Which statement about yourself or about your life with respect to this negative future scenario bothers you the most/is most repulsive?" (SUD-augmenting statement) this reveals answers such as "My life is boring without alcohol," "I will lose all my friends," and so forth.

People differ in the extent to which they have and are aware of the presence of their doomsday scenarios. The clinician should ask for it with some persistence, and not be afraid to trigger these fantasies. The higher the SUD of these flash-forwards, the more valuable it seems to confront the addicted patient with his or her feared visions and help him or her to learn to reevaluate it in a realistic and empowering way, especially combined with Module 3 (PTG). When people say that they are not afraid of abstinence because their aim is controlled use (or behavior), they are often not aware that their wish for controlled use is motivated by a negative image of abstinence. In accordance, our clinical experience is that many patients with a stated goal of controlled use shift to at least a period of full abstinence during AF-EMDR. So searching for a relevant flash-forward is still valuable despite intentions to pursue controlled use. Examples of negative images about abstinence are "alone and bored at the kitchen table," "ridiculed by my friends at a party" and "old and still craving."

Module 7: Addiction-Focused EMDR on Negative Flash-Forwards of Relapse

This module is aimed at reducing the fear of a relapse. This may sound counterintuitive for two reasons. First, the fear of a relapse seems to be a healthy fear without the necessity to be reduced. Secondly, relapses are not unrealistic or irrational, they happen more often than not in the course of addiction treatment. However, the underlying catastrophic aspects of how the person visualizes a relapse is often a question of all or nothing, for example, "all will be lost," "then I'll end in the gutter," "I am a total failure," "I have gone back to day one," and so forth. If a person imagines the outcome of a possible relapse as very negative and highly probable, he or she will be hampered to try or actual give up after a setback. Desensitizing and reevaluating these catastrophic images can help the person to gain a more realistic image of a possible slip or relapse; as an experience to learn from and not to be paralyzed by.

The NC is usually "I cannot handle (the image of) relapsing" and corresponding positive cognitions (PCs) are "I can handle this catastrophic image" (because it is not realistic to think that everything is lost after a slip) or "I am in control." Good questioning is essential to activate flash-forwards that the person is often not fully aware of. During EMDR on a flash-forward of relapse, past memories of relapses can arise, especially when not already treated with Module 8. Earlier relapses are reprocessed when these memories arise, in the chain of associations.

Our experience is that flash-forwards quickly lose their frightening features. Patients start to see nuances in their all-or-nothing image of a relapse. They feel empowered when they realize that—even when there will be a relapse—the present situation is different from the catastrophic image in their head, or in the past. Spontaneous rescripting is the rule rather than the exception. The judgment of the own abilities to handle the situation has increased.

Module 8: Addiction-Focused EMDR for Memories of Relapse

Modules 8 and 9 are AF-EMDR modules based on the concept of the addiction memory (Boening, 2001) as described earlier. Modules 8 and 9 are also key features of the CravEx approach of Hase (2010).[1]

In Module 8, past memories (first, worst, most recent) of relapse are identified and reprocessed (see Hase, 2010, and Hornsveld & Markus, 2016b, for a comprehensive description of the procedure). Reprocessing memories of relapse serves two aims according to Hase (2010): first, to reprocess the maladaptive memories of the addiction memory by AIP model, and second, to reduce levels of craving. Hase in his description (no verbatim or case descriptions available) of the procedure seems to focus on the second objective, reducing the level of craving, measured by the LoU. However, we observed that retrieving memories of relapse activate a sense of powerlessness that is highly maladaptive, as demonstrated by NCs such as "I am weak," "I cannot cope," "I am a slave of my behavior," and so forth.[2] Craving may be low, whereas SUD may be high. We recommend, therefore, to enquire about the SUD as well, next to the LoU. Reprocessing these memories seems especially healing when the patient is able to shake of this paralyzing feeling through EMDR therapy, by reevaluating feelings of powerlessness, self-worth, and mastery.

To make sure that all relevant debilitating memories are considered, we not only ask for memories of relapse but also for other relevant memories of lack of control, "What other memories do you have whereby you clearly lost control over using/doing [name substance or behavior]? and "What other experiences provide the strongest 'proof' that you cannot handle using/doing [name substance or behavior]? In response to this last question, for example, an alcoholic father mentioned that he was drunk at the wedding of his daughter. It was not a relapse, but a painful demonstration that he has no guts and will never have. After reprocessing this memory, he decided to apologize to his daughter, took the responsibility and felt more decided and powerful than a long time before. Hase (2010) starts with the most recent memories, using the argument that they are easier to access and evaluate, but starting with the most salient, most significant, agreed upon targets is well defendable.

Module 9: Addiction-Focused EMDR for Memories of Craving

In this module past memories (first, worst, and most recent) of craving are identified and treated with EMDR (for a full description, see Hase, 2010, and Hornsveld & Markus, 2016b). The reprocessing of memories of craving is almost always included in an AF-EMDR treatment plan. Indeed, in the case conceptualization or behavioral analyses of many patients, craving—a resultant of the triggering the addiction memory—is an important maintaining factor.

Measures are the Level of Urge (LoU and/or the LoPA). Aim is to reach a maximum reduction, preferably 0, before switching to installation of a PC. However, LoU and LoPA may still be rated 1–2 after successful and prolonged processing. We feel this is acceptable because the real aim is to maximize experienced control over craving. In a GHB case study (Qurishi et al., 2016), reducing the level of daily life craving was the main objective, and Module 9 was chosen to start with. Three "craving memories" were identified, the first being "alone at home, dosing a GHB-fix." Retrieval of these memories led to acute craving levels of 8–10 LoU. To maximize LoU and LoPA the therapist asked for a threshold-lowering statement instead of the NC, "When I use GHB, my life is much more fun."

To start reprocessing when the LoU is as high as possible, we ask for a craving-augmenting-, or threshold (for subsequent use)-lowering statement, which often is a statement to give in to their desire (e.g., "just one time"). Key question is "What words do increase your urge to perform the behavior?" Craving is increased more by these statements than by asking for an NC ("What words best go with the picture that express your negative belief about yourself now?"). In our experience, this latter question usually leads to a decrease in craving. See Hase (2010) for a full description of this procedure, and see Hornsveld and Markus (2016b) for the variant with the craving-augmenting statement.

Module 10: EMDR on Positive Memories

Since the last publication on CravEx (Hase, 2010), Müller (2013) described the significance of positive episodic memories (e.g., the vivid memory of a first shot of heroin, or the positive memory of being one of the boys while drinking) in experiencing and anticipating drug use. Thus, not only memories of relapse and craving are powerful forces to keep someone addicted but positive memories as well. We already stated that EMDR on positive touchstone memories could be a promising adjunct to current treatment options. In this module, the first, most pleasant and most recent positive memories are selected and reprocessed. The attractiveness of the positive memory can

best be expressed by either the LoU (Popky, 2010) or LoPA (Knipe, 2010).

It is a typical observation that after a few sets of positive associations, the person starts to see the negative aspects of the target situation, for example, the social consequences or the hangover. Just like positive associations appear in trauma treatment, as soon as the person is no longer overwhelmed by the intrusive, emotional image, an overly positive memory turns into a realistic, adaptive version before it is "resaved" (reconsolidated) in long-term memory. Of course, on a rational level, the information about the negative consequences was already available, but here it is adaptively connected to the addiction memory.

From a theoretical viewpoint (learning theory) and validated by our clinical observations, three kinds of negative aspects may appear in the association chain of the addictive patient: (a) the presence of negative consequences, for example, hangover, shame, physical symptoms; (b) the absence of positive consequences, for example., no interesting job, no healthy friendship (of course, a and b are two sides of the same coin); and (c) the *function* of the addiction becomes painfully accessible, what they are looking for and what they are trying to avoid, for example, "I now realize that I am not drinking because I like to get drunk, but I want to get free, I am afraid for all those responsibilities."

To illustrate an experience we have had with this module, a patient with binge eating disorder recalled a positive memory of eating large amounts of chocolate on the coach before the TV, her craving-augmenting statement being "chocolate is my best friend." After initial associations on the sweetness of the chocolate and the sense of comfort (positive associations), she realized the negative feelings afterward and her overweight (negative consequences) and that her friends were probably elsewhere, having fun without her (absence of positive consequences). After a while, she became sad and stated, "It is not about the chocolate, I hate it, I just want to have something for myself, to feel connected . . . " (function of the addiction). The therapist knew the issues of loneliness and feelings of abandonment; they were part of the treatment plan but decided to continue reprocessing this memory by going back to target until the sweetness of the chocolate was almost gone. If new material had come up, the therapist would probably have allowed more associations, but in this module, the main aim is to reduce the attractiveness of the chocolate by AIP. At follow-up the patient said, "I still like chocolate, but the craving has gone, I now feel that it is a surrogate. You took away my best friend."

Module 11: EMDR on Feeling States and "Linking Memories"

This module is based on the work of Miller (2010) and is a nice variant of the previous module. Miller's starting point is the function of the addictive behavior; he emphasizes that every unhealthy behavior (substance use or behavioral addiction) is linked with an underlying healthy psychological desire. According to Miller (2010), focusing on the urge does not automatically reveal this actual psychological need (e.g., longing for approval, bonding, or competence). For both the patient and the therapist, it is not directly clear which part of the behavior is rewarding, and which need is satisfied, so this needs to be investigated first. In the earlier case of the patient with binge eating disorder, the answer could be "the most intense feeling is the very start of the binge, it gives me a feeling of warmth and belonging." Miller would then ask, "When you let yourself remember that event of starting the binge, how intensely do you feel that you belong?" With the floatback technique, Miller (2010) would then try to identify memories representing this linkage. He assumes that strong positive memories are formed within emotionally deprived persons: the more the need for a specific feeling, the stronger reaction will be when the healthy desire is satisfied. The chocolate eating woman, for example, could have retrieved that she often went to her neighbor when her parents were arguing, and that she was welcomed with nice words and sweets and had experienced a feeling of belonging. The starting memory for reprocessing may be this older memory or the most recent; whatever is most potent (more examples in Miller, 2012).

From a learning-theory perspective, this module is interesting because it directly addresses memory representations which are rewarding because they either fulfill a psychological need or because they help to avoid negative feelings. For a full description of the FSAP, see Miller (2010) and Hornsveld and Markus (2016b).

Module 12: EMDR on Positive Flash-Forwards of the Behavior ("Dry Use")

This module is based on the literature of desire thinking (Caselli & Spada, 2015), flash-forwards (Logie & de Jongh, 2014), and our clinical application of the procedure. Two appetitive flash-forwards are typically reported in addiction: flash-forwards of *performing* the behavior (this module) and flash-forwards of the *desired results* of the behavior (next module). Vivid, intrusive imagery and perseverative thoughts regarding the behavior or use of the drug is a common feature in addiction and is called "desire thinking" (Caselli & Spada, 2015) or "dry use." It is known to escalate

craving and drive to subsequent use. The corresponding memory representation can be conceptualized as a flash-forward of imminent use (seeing oneself sitting on the bench and eating chocolate, tonight). Given its appetitive nature, we use the LoPA or LoU scale to rate its attractiveness, whatever is most prominent. We also use a craving or attractiveness-augmenting statement, for example, "I'm on top of the world!" or "I need this." As with all dysfunctional positive memories, we frequently observe that strong bodily sensations arise. As soon as they decrease, more adaptive associations arise, especially when a person is highly motivated. Healthy alternative scenarios appear as soon as the overwhelming desire has decreased.

Module 13: Addiction-Focused EMDR on Positive Flash-Forwards About the Desired Goal

In this module, EMDR is used to desensitize appetitive flash-forwards of desired goals that a patient tries to achieve with the addictive behavior (e.g., "winning the jackpot" or "having a ball with friends getting hammered this weekend"). The patient visualizes not the behavior itself, as in Module 12, but the desired outcome of the behavior. For example, for a shopping-addicted patient, the shopping itself was not rewarding but showing off new possessions was. A recurrent flash-forward was the image of herself in an expensive wedding dress, watched by admiring family members.

Other examples from our caseload are (a) a woman who was stalking her ex-boyfriend had a flash-forward that she was lying in his arms again. Desensitizing this memory was far more effective than any other intervention because she realized during reprocessing that this coveted state was never going to happen, something she rationally already knew; (b) a convicted thief in a forensic setting had a positive flash-forward of himself sitting in a white limousine, a fantasy he already had as a child. After reprocessing this flash-forward with EMDR, the limousine was less attractive, a change that may have contributed to his progress.

We again use the LoPA and LoU scales to rate the attractiveness; we also use a craving or attractiveness-augmenting statement instead of a NC. The PC in flash-forwards is always "I can handle (this image)."

Module 14: Addiction-Focused EMDR on Triggers

The desensitization of urge triggers is central in both Popky's (2010) DeTUR as well as Hase's (2010) CravEx approach. For the addicted person, daily life is full of risks, situations that may evoke strong urges or even relapses. Self-control procedures generally consist of mapping these situations and making plans (or learning new ways) to deal with these situations. Avoiding is one of the most effective strategies, but this is not always possible or desirable; an ex-alcoholic will inevitably visit parties where alcoholic drinks are offered. In this module, AF-EMDR is applied to reduce craving in these situations. The procedure starts with the identification of urge triggers, and then starting to desensitize them one by one, starting with the weakest trigger (Popky, 2010) or with the one of choice by the patient (Hase, 2010; Hornsveld & Markus, 2016b). Reprocessing is often very rapid, especially when memories of craving have already been desensitized in Module 9. Another observation is the frequent rescripting during reprocessing: for example, a son, for whom it is difficult to visit his father, because his father usually insists on drinking large quantities of good wine at dinner. During reprocessing, the son is determined to call his father and to tell him in advance that he is not drinking any more, and that he will refuse any offer. The image of father offering a wine lost its attractiveness and tension (LoU = 0, Validity of Cognition [VOC] = 7, "I can handle this").

If a patient reports a lapse or relapse between sessions, this module can be applied to the triggers that brought up the urge to use.

Module 15: Future Templates, Imaginal Rehearsal, and Behavioral Experiments

The installation of future templates, as described in the EMDR standard protocol (Shapiro, 2001, 2010) is always important to obtain stable treatment effects. Difficult situations that the patient would like to cope with are mostly the same as the "trigger situations" of the previous module. The alternative scenarios that emerge during spontaneous rescripting in Module 14 can often be the future templates of Module 15. Both modules may be offered in an integrated way.

Future templates are—by definition—images or snapshots of effective coping. The next stage is to ask the patient to play a movie in their mind about future coping, with a beginning, middle, and end. If tension is felt, or blocks are hit, the patient is asked to open the eyes and follow the fingers of the therapist. Therapists can make some suggestions to help inoculate their patients against future problems. If necessary, education on social skills and customs is provided first. Resourcing (Modules 1 and 2) can also be helpful to prepare the patient for difficult situations. Good worksheets for future templates can be found in Shapiro (2010). Imaginal rehearsing can by continued in the form of homework. The next stage is

performing behavioral experiments (e.g., demonstrating adequate coping behavior in a trigger situation to see whether the patient can handle the associated stress). In the subsequent discussion of the experiments, new triggers and future templates may emerge that need some attention.

Discussion

More than 20 years of publications on EMDR therapy in addiction has yielded interesting ideas, different approaches, and promising results. This article aimed at presenting a critical analysis of the literature and a summary of existing protocols. Based on new developments in working mechanism research, we presented additional interventions for AF-EMDR. These new targets pertain to the reprocessing of positive memories, and positive and negative flash-forwards. The article ended with a palette of conceivable targets for EMDR, worth reprocessing when conceptualized as having a significant impact on the continuation of addiction. Clinical experiences are positive, both of us, our colleagues, and our predecessors, Hase, Popky, Knipe, and Miller, whom we owe a great deal of thanks.

Qurishy and coauthors (2017) describe a GHB-addicted patient who, although her regular treatment was successful, suffered from serious cravings and felt on the edge of relapse. The case report nicely demonstrates how interventions aimed at increasing motivation and self-control can be a major and necessary first step, but were unable to deliberately reduce cravings during the day, in this case. The only way to try to reduce her cravings was to do it indirectly, by avoiding craving-inducing situations (thus by self-control or stimulus control in this case). After reprocessing specific craving inducing images, spontaneous craving episodes declined substantially, without further self-control techniques.

As already mentioned in the introduction, addiction treatment (besides pharmacotherapy) relies heavily on self-control procedures. New developments are often new variants to increase motivation and self-control. In this respect, EMDR is different. The presented PEIA may help to disentangle different approaches and guide future research. Despite the great clinical expertise in the field, impressive case reports, and a handful of (quasi-) experimental studies, research is far behind clinical practice. Some recommendations for future research on EMDR in addiction:

- When designing studies, describe which components (as described in Table 2) are used exactly, so results can be replicated.
- Elaborate on choices made when using EMDR therapy as a primary or add-on treatment. If used as an add-on treatment, try to keep TAU as constant as possible and measure relevant aspects of TAU (e.g., total time-in-treatment, treatment intensity),
- If elements of the PEIA are used, consider to design the study so that the effects of different interventions can be distinguished (e.g., by using a component study design, using different orders and/or by pre- and postintervention measurements). If possible, try to relate participant or addiction characteristics to outcome of different interventions.

We are currently involved in an RCT in patients with alcohol addiction (Markus et al., 2015). Unfortunately, preliminary results seem disappointing, both for TAU, as for the additional value of several AF-EMDR modules. The results also suggest that, in contrast to the finding of Hase and colleagues (2008) in an inpatient setting, destabilization in some participants in the experimental group (possibly because of AF-EMDR therapy in participants with latent PTSD and a high tendency to disengage from treatment to cope with painful feelings) as well as a significant treatment dropout (in both AF-EMDR group as in TAU) can be an issue in an outpatient setting. The final results will be presented elsewhere but we would like to conclude with some important points:

- The premise that successful processing of addiction-related memory representations should translate into a clinical significant outcome is based on our understanding of the relationship between traumatic events and the development of PTSD. In single trauma, this refers to "one-trial learning." In cases of prolonged or repeated traumatization, this relationship is essentially the same. However, as discussed before, the genesis and maintenance of addiction disorders is a multifactorial determined process, complicated by self-initiated and highly-repeated use or behavior as well as appealing outcomes. Therefore, the relationship between successful processing of addiction-related memory representations and clinically relevant outcomes may also be different. Research thus far suggests but has not unequivocally proven this relationship. If this relationship exists, however, demonstrating a clinical significant effect in addiction may require differences in timing, duration or intensity of AF-EMDR therapy as would be expected from our experiences from TF-EMDR.
- Although abstinence is not an absolute prerequisite for TF-EMDR as argued earlier, it may be different in AF-EMDR. In our experience with smokers

for instance, we have noticed that pre-EMDR commitment to abstain from smoking before the first session, seems to "mobilize" the craving and emotional charge associated with certain target images and may speed up the reprocessing process. What it does is increase a sense of "cognitive conflict" between the "wanting" and higher order goals pertaining to, for instance, remaining abstinent to keep a job or increase marital satisfaction. Hase and colleagues (2008) treated participants in an inpatient setting in which abstinence was enforced. Eliciting relevant memory representations in that context may induce more "cognitive conflict" than in nonabstaining participants in an outpatient setting.

- Finally, some PEIA interventions target "old pain" (Modules 3–5; Table 2) and therefore may destabilize some patients. The fact that Hase and colleagues noted no destabilization effects may be because the CravEx protocol has a different focus (PEIA Modules 1, 8, 9, 14 and 15). Based on our experience, the reliving of old pain in addicted patients in itself is not so much troublesome, most participants handle it well, but the fact that some participants choose to disengage from treatment when this occurs is problematic. In a period of weeks, they can severely escalate their substance use, which may coincide with an increase in comorbid psychiatric comorbidity and result in a crisis. In an inpatient setting, this might not have occurred. So we need to establish guidelines based on patient characteristics of who can be treated in an outpatient setting and who needs the holding provided by an inpatient setting.

We hope to have demonstrated the potential and scope of EMDR therapy in addiction. Clearly, further research is needed to see whether and if so, under which conditions EMDR therapy is effective in addiction disorders.

Notes

1. CravEx (Hase, 2010) consists of AF-EMDR Modules, 8, 9, 14 and 15, preceded by resourcing (Module 1) and followed by future templates (Module 15).

2. This may be similar in memories of withdrawal.

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