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Narrative summary of data

Table of contents

Introduction

There are various ways the individual interventions summarized here could be grouped. One could group interventions as antecedent; consequence-based or self-regulation interventions (Gaastra, Groen, Tucha, & Tucha, 2016), however certain interventions covered here, such as problem-solving together, do not fit clearly into one of these categories. A simple way to categorize skills would be those that could be used before, during or after the target behavior. However certain interventions, such as communication skills or monitoring may be needed at all three points. We found it useful to group antecedent interventions together, structure, and reinforcement-based interventions together, and to group other interventions, such as communication and distraction, with their sub-categories. In keeping with the model of attunement plus a toolkit of options, interventions and intervention groups are listed alphabetically, so that users can select skills for use with attunement to what would best suit the particular needs of the child and situation.

1. Antecedent interventions

1.1. Antecedent interventions: General

1.1.1. Description

Antecedent interventions are environmental modifications in which the events or circumstances preceding the target behavior are altered. There are many different types. Common antecedent interventions include: incorporating student interest into educational activities; giving choices; preparation for upcoming activities; modifying task difficulty or environmental enrichment, also called non-contingent reinforcement (Wong et al., 2015). Nine included reviews examined antecedent interventions in general. The rest examined specific antecedent interventions, which will be discussed under their own headings.

1.1.2. Review evidence

Antecedent interventions were one of the interventions found to be effective as an individualized PBS (positive behavioral support) intervention for negative behaviors, often severe, that had not responded to first or second tier PBS interventions among children and adolescents, with and without disabilities, in school settings (Goh & Bambara, 2012).

Antecedent interventions were examined in relation to food selectivity and food refusal, among children and adolescents with and without food-related medical problems (Seubert, Fryling, Wallace, Jiminez, & Meier, 2014). Antecedent interventions alone were ineffective for food refusal, but they enhanced escape extinction in a significant percentage of cases. One antecedent intervention (simultaneous presentation) was successful for 3 children with food selectivity.

To treat stereotypy in children and adolescents with ASD (Mulligan, Healy, Lydon, Moran, & Foody, 2014), antecedent interventions based on prior functional analysis were

effective for 6 participants, and ineffective for 1. Non-function-based antecedent interventions were effective in 2 studies and ineffective in the other 2. Antecedent interventions for stereotypy were classified as "promising but lacking sufficient evidence", according to Chambless & Hollon (1998) criteria. Various antecedent interventions were used for target behaviors such as challenging behavior, social and communication skills and motor skills, among adolescents with ASD (McDonald & Machalicek, 2013). Five of seven studies reported positive outcomes, 1 reported mixed outcomes, and 1 reported a negative outcome, finding that motor skills actually deteriorated after the introduction of ambient prism lenses. Of the 5 studies reporting positive outcomes, one reported generalization and two reported maintenance of these positive results. Another review examining antecedent interventions in relation to various target behaviors for children and adolescents with ASD, found enough studies where they were effective, to classify antecedent interventions as an evidence-based practice (WWC 5-3-20 guidelines) for children and adolescents with ASD (Wong et al., 2015).

Two reviews examined antecedent interventions for children and adolescents with ADHD in school settings. One meta-analysis showed that antecedent interventions such as choice, non-contingent attention, music and computer assisted instruction reduced off-task and disruptive classroom behavior, but had smaller effects than consequence-based or self-regulation interventions (Gaastra et al., 2016). Antecedent interventions such as adapted teaching methods, tasks, or classroom arrangement were examined in relation to inattention, hyperactivity, impulsivity and poor scholastic performance of children and adolescents with or at risk of ADHD in school settings. Meta-analysis found beneficial effects on symptom and scholastic outcomes. Teacher ratings were mixed, negative in 1 study put positive in 6 (Richardson et al., 2015).

Two reviews examined antecedent interventions involving motivating operations (MO). A MO is an antecedent variable (such as attention, the nature of a required task, environmental enrichment or personal states such as fatigue), that affects how strongly the participant is reinforced by the consequences of their behavior (e.g., attention or escape). Antecedent interventions involving MOs were found have clear effects, often reducing problem behavior in children and adolescents with ID (Simo-Pinatella et al., 2013). The second review focused on problem behaviors maintained by negative reinforcement, such as escape from demands, among children and adolescents with and without disabilities (Langthorne, McGill, & Oliver, 2014). In the case of negative reinforcement, the MO influences how reinforcing it is to escape or avoid a demand. Examples of interventions used included: altering the mode of demand presentation, non-contingent escape or scheduled breaks, modifying task difficulty, or adding reinforcement to the demand situation. In most cases, altering the mode of demand presentation in various ways, or adding different kinds of reinforcement to the demand situation influenced the level of problem behavior. Outcomes of the other reviewed interventions involving MOs are discussed below under the headings of specific antecedent interventions.

1.1.3. Comments

It is clear from the above evidence that, in general, antecedent interventions can be effective, however this information is not particularly useful for a toolkit approach unless the specific antecedent interventions used are known. The specific antecedent interventions for which reviewed evidence was found are reported below.

1.2. Antecedent intervention: Accessibility

1.2.1. Description

Accessibility involves slicing of fruit or vegetables instead of presenting them whole, or preparing, presenting and maintaining healthy food items in other ways that enable or encourage children and adolescents to eat them.

1.2.2. Review evidence

Accessibility was examined in three public health reviews in relation to healthy eating, such as fruit and vegetable consumption, among children and adolescents (Kessler, 2016; Pearson, Biddle, & Gorely, 2009; Yee, Lwin, & Ho, 2017). Results were equivocal, with some studies finding a positive association, and some no association (Pearson et al., 2009), and a meta-analysis showing no correlation with healthy eating (Yee et al., 2017). The third review reported increased selection and consumption of oranges in school settings when they were sliced, and increased selection of sliced apples in middle school but not elementary school (Kessler, 2016), however these findings came from only two included studies.

1.2.3. Comments

The evidence reviewed here does not give a clear indication that accessibility is an effective intervention to encourage healthy eating.

1.3. Antecedent intervention: Availability.

1.3.1. Description

Availability refers to whether schools or caregivers make certain items available to children and adolescents or whether access is restricted or prevented.

1.3.2. Review evidence

Three narrative reviews found that increasing availability of healthy dietary items such as fruit, vegetables and water in school settings increased consumption of these items by children and adolescents (Jaime & Lock, 2009; Sharma, 2007; Shepherd et al., 2006). In qualitative studies, adolescents identified availability of healthy food as a facilitator, and lack of availability as a barrier, to healthy eating (Shepherd et al., 2006). Limiting the availability of unhealthy items may also be important. Sharma (2007) reviewed a study in which cool filtered water was provided. Water consumption significantly increased, but there were no changes in soft drink consumption. In qualitative studies, adolescents identified wide availability of desirable unhealthy foods as a barrier to healthy eating (Shepherd et al., 2006). Two studies reviewed by Jaime and Lock (2009), examining restriction of availability of unhealthy foods in schools, showed limited but significant decreases in sales of restricted foods, but one of these studies found an increase in ice cream sales over the same period, suggesting that students may compensate for the lack of access to one kind of unhealthy food, by buying another kind. Review authors suggest that regulation policies are unlikely to be successful if they focus on a single unhealthy food.

Five reviews examined availability of dietary items in the home in relation to child or adolescent consumption of healthy or unhealthy food with mixed results. In 3 reviews, availability of healthy items such as fruit and vegetables, or unhealthy items such as sugar

sweetened beverages in the home did not show a consistent association with child intake (Cook, O'Reilly, DeRosa, Rohrbach, & Spruijt-Metz, 2015; Mazarello Paes et al., 2015; McClain, Chappuis, Nguyen-Rodriguez, Yaroch, & Spruijt-Metz, 2009), although meta-analysis showed that child-report of availability was significantly more likely to be associated with intake than parent-report (Cook et al., 2015). One review found that home availability was positively associated with children's fruit and vegetable consumption, but not consistently related for adolescents (Pearson et al., 2009). A more recent meta-analysis (Yee et al., 2017) examined home availability of healthy food, non-availability of unhealthy foods, and parental control of availability of unhealthy foods, finding that these were consistently associated with decreases in unhealthy eating and increases in healthy eating for children and adolescents.

Three reviews examined availability of alcohol in relation to adolescent alcohol consumption and related problems. All three examined parental allowance or supply of alcohol. This could take the form of parental offers of alcohol, adolescent drinking at home, adolescent drinking at family gatherings, parents allowing or supervising adolescent alcohol use; hosting an event or party with alcohol (social hosting) or providing (furnishing) alcohol for their underage children and their children's friends. The main arguments for parental supply of alcohol seem to be that allowing alcohol use at home will teach children to drink responsibly and prevent risky drinking with peers (Kaynak, Winters, Cacciola, Kirby, & Arria, 2014). This belief was not supported in any review. Meta-analysis of longitudinal studies showed that parental supply of alcohol was associated with earlier alcohol initiation and higher levels of later alcohol use (Ryan, Jorm, & Lubman, 2010), as well as increased likelihood of risky drinking later in adolescence (Sharmin et al., 2017b). A narrative review (Kaynak et al., 2014) including both cross-sectional and longitudinal studies found mixed results from the cross-sectional studies, but all the

longitudinal studies found that parental allowance of drinking at home was related to a higher likelihood of adolescent drinking and higher frequency of alcohol-related problems. Review authors suggest that findings provide strong evidence for the notion that the easier alcohol is to obtain, the more adolescents are likely to drink, but also suggest other potential mechanisms such as perceived parental approval or acceptance of alcohol.

1.3.3 Comments

The above evidence suggests that both making healthy items available, and restricting access to unhealthy items are effective, and could be seen as important responsibilities of caregivers and schools. The results concerning alcohol are particularly salient, as they contradict the popular view that making alcohol available will protect adolescents from risky or excessive drinking. It is clear from the reviewed research that the opposite is true.

1.4. Antecedent intervention: Behavioral Momentum

1.4.1. Description

Behavioral momentum is a common term for what is sometimes known as the high probability instruction / command / request sequence (HPIS / HPCS / HPRS). Requests are organized so that the participant is asked to complete a series of 3 to 4 brief requests with a high probability of compliance, just before a request with a low probability of compliance. The theory is that this builds momentum, increasing the likelihood of compliance with low probability requests (Radley & Dart, 2016). Task-interspersal is another kind of behavioral momentum, most commonly used to improve the likelihood of responding in academic assignments. It involves interspersing more challenging items with easier items (Cowan et al., 2017).

1.4.2. Review evidence

Four reviews (Cowan, Abel, & Candel, 2017; Lee, 2005; Radley & Dart, 2016; Wong et al., 2015) examined behavioral momentum, all finding that it increased compliance. It was effective, in a variety of settings, for children and adolescents with ASD and other disabilities as well as children without disabilities. Some maintenance of results was shown (Radley & Dart, 2016). This intervention was rated (Radley & Dart, 2016) "probably efficacious" for increasing compliance according to WWC criteria (Kratochwill et al., 2013).

1.4.3. Comments

Reviewed evidence suggests that Behavioral Momentum is an effective intervention for increasing compliance in children and adolescents with and without disabilities.

1.5. Antecedent intervention: Choice

1.5.1. Description

Participants are allowed choices, for example: between tasks, reinforcers, order of activities, materials or settings. Sometimes choice is manipulated in other ways.

1.5.2. Review evidence

Choice was examined in eight included reviews. The first examined manipulation of choice in relation to healthy eating among children and adolescents in school settings (Kessler, 2016). Offering more choice increased consumption of fruit and vegetables. A study that removed the option to decline fruit and vegetables also reported increased fruit and vegetable consumption, and a study requiring students to pre-order, reported increased percentage of students ordering healthier food. Authors suggest that pre-ordering food may decrease unhealthy choices by decreasing hunger-based choices and eliminating sensory cues of unhealthy food.

Six reviews examined choice for children and adolescents, most with disabilities, in a variety of settings and for a variety of target behaviors (challenging, aggressive or disruptive, or appropriate, such as task engagement) (Cannella, O'Reilly, & Lancioni, 2005; Morgan, 2006; Reutebuch, El Zein, & Roberts, 2015; Royer, Lane, Cantwell, & Messenger, 2017; Tullis et al., 2011; Zelinsky & Shadish, 2018). Participants were allowed choices e.g., between tasks, reinforcers, order of activities, materials or settings. All six reviews reported decreases in inappropriate behavior and increases in appropriate behavior. Teachers found the intervention easy to implement (Morgan, 2006), and it has been used successfully as a low intensity, tier 1-type intervention in levelled systems such as PBIS (positive behavioral interventions & supports), for children with and without disabilities in school settings (Royer et al., 2017), as well as, in various settings, for children with severe to profound disabilities (Cannella et al.,

2005; Tullis et al., 2011). However, Morgan (2006) raises the question of whether studies reporting positive outcomes for choice have effectively controlled for preference. When controlling for preference, Morgan (2006) only found modest effects for choice-making, and then only when students were engaged in low-preference activities.

Lastly, choice-making was examined in relation to intrinsic motivation in experimental studies with children and adolescents without disabilities (Patall, Cooper, & Robinson, 2008). Providing choice enhanced intrinsic motivation and the related outcomes of effort, task performance, and perceived competence. Authors caution that although choice has positive effects, it is possible to give too much choice - the effect of choice on intrinsic motivation diminished after five or more choices had been made.

1.5.3. Comments

Reviewed evidence suggests that giving some kind of choice is a helpful intervention to increase appropriate behavior and decrease inappropriate behavior, for children and adolescents with and without disabilities, especially for low-interest tasks. However, giving too much choice diminishes effects.

1.6. Antecedent intervention: Cueing

1.6.1. Description

A cue is a signal to engage in a certain action. Cueing is different from prompting, in that prompts show or tell the participant what to do, while cues do not.

1.6.2. Review evidence

Cueing was examined as an intervention to address drooling in children and adolescents with mild to profound disabilities (Van der Burg, Didden, Jongerius, & Rotteveel, 2007). Participants received verbal, auditory (e.g., beeps), visual, or vibratory cues at different time schedules to prompt target behaviors such as wiping or swallowing. In all five studies, cueing devices were used. Cues were gradually faded. Four of the five studies reported positive results.

1.6.3. Comments

A small amount of evidence suggests that cuing may be effective as an intervention for drooling. There are potentially many other appropriate behaviors that could be increased using cues, but no other reviews were found.

1.7 Antecedent intervention: Effective Instruction Delivery

1.7.1 Description

Effective instruction delivery, also known as a precision request, involves obtaining eye contact prior to issuing an instruction, providing praise for eye contact, issuing the request in a directive form, allowing 5 to 10 seconds for compliance, and providing praise for compliance (Radley & Dart, 2016).

1.7.2. Review evidence

Effective instruction delivery was examined in relation to compliance with adult requests, in children and adolescents with and without disabilities (Radley & Dart, 2016). Results showed increased compliance, and the intervention was rated "probably efficacious" for increasing compliance according to WWC criteria (Kratochwill et al., 2013).

1.7.3. Comments

A small amount of evidence suggests that this intervention may be effective for increasing compliance. More research is needed to confirm this.

1.8. Antecedent intervention: Errorless Compliance Training (ECT).

1.8.1. Description

Related to the high probability sequence, errorless compliance training involves allowing the child to demonstrate compliance at higher-probability requests, before systematically introducing lower and lower-probability requests (Radley & Dart, 2016).

1.8.2. Review evidence

Errorless compliance training was reviewed by Radley and Dart (2016) in relation to compliance among children, age 2 to 10, with and without disabilities. Results showed increased compliance (initiation and completion) with maintenance of results.

1.8.3 Comments

A moderate amount of evidence suggests effectiveness of ECT for compliance.

1.9. Antecedent intervention: Inhibitory Stimulus Control Procedures (ISCPs).

1.9.1 Description

With ISCPs, participants are taught to engage in a target behavior only when a specific stimulus is present (e.g., flapping arms is only allowed when wearing a particular wristband). In this way a participant is given a clear signal, showing when the behavior is appropriate and when it is not.

1.9.2. Review evidence

Inhibitory stimulus control procedures (ISCPs) were examined as a treatment for stereotypy among children and adolescents with ASD (Lydon, Moran, Healy, Mulhern, & Enright Young, 2017). All 11 included SCD studies showed positive results. Two studies assessed and reported generalization. Two reported maintenance of results at different probes over several weeks. Further research is needed, however, before ISCPs can be classified as an evidence-based practice.

1.9.3. Comments

The above evidence shows that ISCPs can be effective for stereotypy among children and adolescents with ASD. There are potentially other uses for this intervention, with other populations. For example, parents might tell their children that the neighborhood children may only come over to play when a welcome sign is hung on the gate, or that a certain game may only be played when their father is there to supervise it. However, no other reviews were found for this intervention.

1.10 Antecedent intervention: Interest

1.10.1 Description

The interests or preferences of the participant are incorporated into a required task.

1.10.2 Review evidence

Interventions incorporating the interests or preferences of children and adolescents with various diagnoses (e.g., ADHD,ASD, DD, ID, EBD,LD, serious emotional disturbance, severe behavior problems) in school settings were examined in relation to academic performance and various problem behaviors (e.g., aggressive; resistant; disruptive; off-task) (Morgan, 2006). Student behavior always improved during high-preference activities, regardless of whether a choice among these activities was allowed. Academic performance also improved. Teachers considered the intervention easy to implement.

1.10.3 Comments

A moderate amount of evidence shows consistent positive effects for this intervention.

1.11. Antecedent intervention: Modifying task difficulty

1.11.1. Description

In this intervention, the difficulty of a task is modified in order to lower the chance of problem behaviors.

1.11.2. Review evidence

This intervention was employed to address problem behaviors maintained by negative reinforcement, such as escape from demands (e.g., aggression, destructive behavior, noncompliance, off-task behavior), among children and adolescents with and without disabilities (Langthorne et al., 2014). In all studies, decreasing task difficulty reduced problem behavior. Another review (Warmbold-Brann, Burns, Preast, Taylor, & Aguilar, 2017) examined this intervention to address off-task and disruptive behavior, two common escape-maintained behaviors, among children, with and without disabilities in school settings. Task difficulty was modified to match the skill-level of the student. Meta-analysis results showed moderate positive effects on behavior.

1.11.3. Comments

The above evidence shows the effectiveness of matching task difficulty to student skill-level to reduce escape-maintained challenging behaviors. This seems mostly to have involved decreasing task difficulty. It is possible that increasing task difficulty could improve behavior for students who are bored by tasks which are too easy for them, however no reviews explicitly addressed this.

1.12. Antecedent intervention: Non-contingent escape or scheduled breaks

1.12.1. Description

Non-contingent escape may involve allowing the participant to ask for short breaks in an activity, when needed, or offering short breaks according to a schedule. Both are used to reduce the likelihood of escape-motivated challenging behavior during demand situations.

1.12.2. Review evidence

This intervention was employed to address problem behaviors such as aggression, disruptive behavior or unauthorized breaks, maintained by negative reinforcement, such as escape from demands during lessons or dental treatment (Langthorne et al., 2014). Both non-contingent escape and scheduled breaks were found to reduce problem behavior among children and adolescents with and without disabilities.

1.12.3. Comments

The small amount of review evidence available for non-contingent escape and scheduled breaks, shows effectiveness in school or dental settings. This intervention may also be useful to caregivers in home settings in situations such as supervising homework or brushing a sensitive child’s hair or teeth, but no reviews were found addressing use in the home.

1.13. Antecedent intervention: Non-contingent Reinforcement (NCR)

1.13.1. Description

NCR is an antecedent intervention in which reinforcement is added to the environment without the participant needing to earn or qualify for it. It is sometimes referred to as environmental enrichment, object manipulation, matched stimulation or time-in. Time-in describes a reinforcing environment in which physical touch, contact & verbal praise, are amply available.

1.13.2. Review evidence

NCR was examined in four SCD studies in relation to aggression in children and adolescents with mild to profound developmental disabilities (Matson, Dixon, & Matson, 2005). Treatment was successful in reducing aggression. In one study comparing NCR with extinction, both worked, but NCR reduced aggression faster and without an extinction burst. However, the other studies showed that NCR was more effective when combined with other interventions such as differential reinforcement.

A recent meta-analysis examined NCR in relation to problem behavior (such as self-injury, stereotypy or pica) found to be maintained by automatic reinforcement, among children and adolescents with ID and / or ASD (Gover, Fahmie, & McKeown, 2018). Participants were given free (noncontingent) access to tangible items. This is referred to as noncontingent reinforcement (NCR), environmental enrichment, object manipulation, or matched stimulation. NCR was used alone or in conjunction with other interventions such as prompting, reinforcement, response blocking, restraint, response cost or reprimands. Results showed that environmental enrichment (NCR) alone was effective, in part of the sample, but adding other interventions often improved results. NCR was more effective for children (1-12) than for

adolescents (13-17). Combining NCR with other interventions was not substantially more effective than environmental enrichment alone for children, but combination increased efficacy for adolescents. Environmental enrichment alone and in combination with other manipulations was slightly more effective for females than males.

Time-in, a form of NCR, was examined in relation to compliance with adult requests in children with and without disabilities, age 2 to 11 (Radley & Dart, 2016). Results showed increased compliance, and the intervention was rated "probably efficacious" for increasing compliance according to WWC criteria (Kratochwill et al., 2013).

1.13.3. Comments

The above evidence shows that NCR can reduce challenging behaviors, although, used alone, it is not always enough to eliminate it. Time-in is often considered the opposite to time-out, however it should not be considered a replacement for time-out, as time-in is an antecedent intervention, while time-out would be used during (to interrupt), or immediately after a challenging behavior.

1.14. Antecedent intervention: Physical arrangement of the classroom

1.14.1. Description

Physical arrangement of the classroom is an antecedent intervention involving changes to classroom design such as location of materials, color, attractiveness of room, shelving, walls and visual dividers.

1.14.2. Review evidence

The physical arrangement of the classroom was examined in relation to appropriate and inappropriate classroom behavior among children and adolescents in grades K-12 (Simonsen, Fairbanks, Briesch, Myers, & Sugai, 2008). Crowding and distraction had a negative impact on student behavior. Classrooms with more walls or visual dividers were associated with lower teacher distraction, lower student distraction from noise, and higher student satisfaction. Changes to classroom design (e.g., location of materials; colour; attractiveness of room; shelving) were associated with increase in appropriate and engaged behaviors.

1.14.3. Comments

Although a small amount of reviewed evidence suggests effectiveness of physical rearrangement of the classroom, these results should be interpreted with caution because of the low methodological quality of this review.

1.15. Antecedent intervention: Precorrection

1.15.1. Description

Precorrection is an antecedent intervention designed to prevent predictable problem behaviors and increase the likelihood of appropriate behaviors, usually by reminding students of rules just before the behavior is expected. For example, before a transition, the teacher might remind students of behavioral expectations for the transition area.

1.15.2. Review evidence

Two included reviews examined pre-correction. One focused on effects on compliance with adult requests (Radley & Dart 2016) and included 3 SCD studies with 12 participants in total, age 1 to 4. Different precorrection strategies were examined: warnings e.g., ‘‘two minutes to clean-up”, or rationales, given before the request. No improvement in compliance was found for warnings or rationales. In fact, with rationales, problem behavior increased for 4 participants. It would seem that these pre-correction strategies do not increase child compliance, but there are too few studies reviewed here to draw any firm conclusions.

A meta-analysis on pre-correction (a PBIS intervention) for children and adolescents with or at-risk for disabilities in general education school settings included 10 studies with a total of 1101 participants (Ennis, Royer, Lane, Griffith, & children, 2017). Target behaviors included problem behavior, off-task or aggressive behavior, and transition time. Students were reminded of expectations or rules just before target behaviors were expected, e.g., just before recess, transitions or a lesson, the teacher would remind students of the desired behaviors for that setting or event. This pre-correction strategy was effective, with positive results across grades, settings and intervention agents. Authors classified precorrection as an evidence-based practice using Council for Exceptional Children's standards (Cook et al., 2014).

1.15.3. Comments

Precorrection involving reminding participants of rules just before the behavior is expected, has been shown to be effective for students of all ages in school settings. This precorrection strategy could be useful to caregivers at home, or in other settings outside of school, but no reviews were found addressing this.

1.16. Antecedent intervention: Preparation

1.16.1. Description

Participants are prepared with information about upcoming events or procedures using videos, booklets, photo's, online education, demonstration with a doll, preparation stories with pictures etc.

1.16.2. Review evidence

Five included reviews examined preparation in medical or dental settings in relation to pain (Davidson, Snow, Hayden, & Chorney, 2016; Leão Goettems, Jung Zborowski, dos Santos Costa, Pereira Costa, & Dias Torriani, 2017; Uman et al., 2013), anxiety (Leão Goettems et al., 2017; Lee, Chui, & Gin, 2003; Manyande, Cyna Allan, Yip, Chooi, & Middleton, 2015), distress (Uman et al., 2013) or co-operation (Leão Goettems et al., 2017; Manyande et al., 2015). Children or adolescents were prepared with information about upcoming procedures such as operations, needle related procedures, mask induction of inhaled general anesthetic, or dental treatment. Methods of preparation included videos, booklets, photo's, online education, demonstration with a doll, preparation story with pictures or photos of child models going through the procedure and, in one study, an exposure and shaping procedure in which children were introduced to the anesthesia mask, and reinforced for successive approximations of desired behavior during induction. The number of studies included in each review for preparation as an intervention were small, ranging from two to seven. Most were Randomized Controlled Trials (RCTs).

Preparation interventions had no significant effect on child or adolescent-reported post-operative pain (Davidson et al., 2016) or pain experienced by children during needle related procedures (Uman et al., 2013). A third review, however (Leão Goettems et al., 2017) reported

that one RCT, in which children were prepared for dental treatment with a pictorial story and slide show, found significantly lower scores for pain.

In terms of anxiety, preparation with media-based interventions for pediatric surgery patients was associated with a significant reduction in anxiety for parents, but not for children (Lee et al., 2003). A review examining preparation for inhaled general anesthetic (Manyande et al., 2015) reported on one RCT addressing anxiety, in which no significant differences were found for child anxiety between a mask exposure preparation intervention and control. Two RCTs reviewed in a third review (Leão Goettems et al., 2017), in which children were prepared for dental treatment with a DVD or pictorial story with slide show, found significantly lower scores for anxiety, while no significant difference was found for anxiety in a third RCT using a pamphlet.

In terms of distress, one review (Uman et al., 2013) reported on two RCTs in which children were prepared for needle-related procedures by being read a preparation story with pictures or photos of child models going through the procedure. Results showed significantly less distress and lower pulse rate than controls. Authors cautioned that conclusions about efficacy cannot be made, however, given the limited evidence available (only 2 RCTs).

In terms of co-operation, Manyande et al. (2015) report on one RCT in which preparation with an interactive computer package was more effective than verbal preparation in increasing co-operation., and another in which children in the mask exposure intervention (preparation for inhaled general anesthesia) showed significantly better co-operation than controls. In the review on preparation for dental treatment (Leão Goettems et al., 2017) the RCT with the story and slide show also reported significantly more co-operative behavior.

1.16.3. Comments

The little reviewed evidence available regarding preparation used in medical and dental settings does not suggest that preparation reduces pain, and there are mixed results for anxiety. There is some indication that preparation could impact positively on distress or co-operation, in which case it would be a valuable addition to the toolkit. More research is needed, however, to be clear on the effectiveness of preparation in medical settings.

Parents or caregivers are frequently advised to prepare children for upcoming events to increase co-operation and decrease resistance (e.g., Gray, 2011). However, no reviews were found examining preparation used by caregivers in non-medical settings. The review evidence for pre-correction and social stories, which are also types of preparation, lend support to the hypothesis that preparation could be an effective and useful intervention to increase co-operation and decrease problem behaviors, but more research is needed.

1.17. Antecedent intervention: Social stories ™

1.17.1 Description

Social stories ™ (Gray & Garand, 1993) are used, mostly, for children and adolescents with autism spectrum disorders (ASD). They are individualized stories, usually with text and pictures (occasionally in the form of a song or video), composed to help a child to learn appropriate social behavior or decrease problem behavior. Each story is designed to help the participant understand and navigate a specific social situation, describing it in detail, highlighting relevant cues, and offering examples of appropriate responding. They are typically short, simple, and used as an antecedent intervention, and thus a form of preparation. They usually contain descriptive sentences (describing the situation), directive sentences (specifying desired behavioral responses in that context) and perspective sentences (describing the feelings of the individual and others in the target situation).

1.17.2. Review evidence

Seven included reviews examined Social Stories ™, or social narratives, as they are sometimes referred to, in relation to a wide range of target behaviors, such as social skills, communication, joint attention, play, academic skills, adaptive skills, challenging behavior such as aggression, disruptive behaviors such as yelling and screaming, or stereotypic behaviors. Six reviews focused on children and adolescents with ASD (Karkhaneh et al., 2010; Leaf et al., 2015; McGill, Baker, & Busse, 2015; Reynhout & Carter, 2011; Styles, 2011; Wong et al., 2015), while one review focused on children, age 2 to 9 without ASD (Zimmerman & Ledford, 2017), i.e. typically developing or with disabilities other than ASD. While most reviewed SCD studies, two reviews included other study designs, including RCTs (Karkhaneh et al., 2010; Styles, 2011). All reviews reported positive results, and several noted the popularity of the

intervention. One found that social narratives meet criteria for classification as an evidence-based practice (WWC 5-3-20 guidelines) for children and adolescents with ASD (Wong et al., 2015), but others, using more rigorous methods, raise several concerns. These include that controlled trials finding positive results have methodological weaknesses (Karkhaneh et al., 2010), that evaluation of efficacy was at times confounded by the use of additional intervention strategies (Leaf et al., 2015; Reynhout & Carter, 2011), and that meta-analysis shows only a small clinical effect on behavior (McGill et al., 2015; Reynhout & Carter, 2011). Zimmerman and Ledford (2017), examining social stories for children without autism also found mixed results. Although there were some positive outcomes, review authors noted that other interventions, such as differential reinforcement or teaching replacement behaviors have a stronger evidence base. This does not mean social narratives are ineffective, but that research evidence is limited at this point for use of social stories for children without ASD. There were relatively few studies available, and even fewer with rigorous enough design to control for variables which may have moderated results, such as additional components in the interventions, or diagnosis of participants.

1.17.3. Comments

The above evidence suggests that effects are not strong enough to support the use of social stories as a primary intervention for challenging behavior. However, their popularity suggests good social validity, and the positive results found in all reviews suggest that they would be a valuable addition to the non-violent discipline toolkit, for use alongside other interventions.

Research is needed on the use of other types of remedial story. The idea that behavior can be shaped by the telling of stories seems universal, with moral tales and fables forming an

important part of most, if not all cultures across the world and throughout history. It could be argued that this is one of the most ancient behavioral interventions, yet no reviews were found on remedial stories other than social stories.

2. Behavior contracts

2.1. Description

Behavior contracts are written documents, agreed upon with the child, that define expected behavior, and outcomes for engaging or not engaging in this behavior (Simonsen et al., 2008).

2.2. Review evidence

Three reviews examined behavior contracts. Use of behavior contracts in school settings was associated, in different studies, with increased on-task behavior and daily assignment completion, improved school grades, and improved student self-control (Simonsen et al., 2008). A meta-analysis on behavior contracts used with children and adolescents to target a range of behavior problems from inappropriate classroom behavior to involvement in crime, found moderate effects on behavior as well as improvement in academic outcomes. Moderator analyses showed benefits for students regardless of grade level, gender, or disability status. Contracts were more effective in reducing inappropriate behaviors than increasing appropriate behaviors. (Bowman-Perrott, Burke, de Marin, Zhang, & Davis, 2015). Another meta-analysis examined behavior contracts used with juveniles at risk for persistent offending or more severe antisocial and delinquent behavior. This review examined components of various interventions in relation to prevention of delinquency, criminal offending, or recidivism. Effects were small, but significant: programs containing behavior contracting were among those yielding the strongest prevention effects. Age, gender and ethnicity did not moderate results.

2.3. Comments

The above evidence suggests that this intervention is effective. Research is needed on the use of behavior contracts by caregivers in home settings.

3. Communication: Adult – child

3.1. Description

Characteristics of good adult – child communication include warmth, openness, respect, child disclosure, and talking about emotions.

3.2. Review evidence

Four reviews examined parent-child communication in relation to sexual behavior in diverse samples (ethnicity & SES), all finding outcomes such as that better parent-child communication delayed the onset of sexual activity, increased responsible behavior such as condom / contraceptive use and decreased sexual risk behavior. (Coakley et al., 2017; Commendador, 2010; Sutton, Lasswell, Lanier, & Miller, 2014; Zimmer-Gembeck & Helfand, 2008).

Two reviews examined parent-child communication in relation to adolescent alcohol use and one in relation to substance abuse including alcohol, tobacco and cannabis. Warm open communication, in which adolescents felt they could share information openly with their parents, significantly decreased the likelihood of adolescent alcohol use and binge drinking (Mynttinen, Pietilä, & Kangasniemi, 2017). A systematic review of longitudinal studies showed that good general communication was associated with delayed alcohol initiation and lower levels of later alcohol use. Alcohol-specific communication did not show an association with alcohol initiation, and there was insufficient evidence to show its association with levels of later drinking. (Ryan et al., 2010). Parenting programs aimed at improving parent-child communication showed some positive effects in preventing, curbing or reducing adolescent substance use (Kuntsche & Kuntsche, 2016).

One meta-analysis examined parent-child communication in relation to child and adolescent delinquency (Hoeve et al., 2009). This was defined as overt (violent offences such as attacking someone with or without a weapon, threatening, murder, and rape) or covert delinquency (non-aggressive acts such as shoplifting, pick pocketing, arson, vandalism, and selling drugs). A weak link was found between open communication and delinquency suggesting that with good communication, delinquency is less likely. Child disclosure was relatively strongly inversely linked to delinquency, which suggests the importance of parenting skills such as active listening and open-ended questions, in non-threatening interactions, which allow safety to disclose.

Collier and colleagues (2016) examined parent-child communication in relation to media time, aggression, substance use and sexual behavior (Collier et al., 2016). Communication involved active parental mediation of child or adolescent media use, in which parents discussed character's choices, central themes, or other components of the media consumed with their child, to promote critical thinking in relation to media. Meta-analysis results suggest that active mediation may have a protective effect on children's vulnerability to negative effects of media on aggression, substance use, and sexual outcomes. These results contrast with results for co-viewing (watching or playing together without discussion), which is associated with increased aggression and media use. It is thought that co-viewing may model high levels of media consumption, and that the parent's presence may send an implicit message of approval of violent media content.

Johnson and colleagues (2017), examined parent-child communication, specifically emotion socialization and emotion coaching, in relation to child conduct problems in diverse clinical and non-clinical samples in USA, Australia, New Zealand, Europe and Asia (Johnson,

Hawes, Eisenberg, Kohlhoff, & Dudeney, 2017). Conduct problems were defined as persistent and developmentally excessive antisocial behavior such as non-compliance, aggression, disruptive, defiant or oppositional behavior, or symptoms of DSM-IV/V disruptive behavior disorders. Parents' emotion socialization behaviors (ESBs) were defined as reactions to emotions, discussion of emotions, and emotion coaching (helping children identify and understand emotions). Positive ESBs include being aware of low intensity emotion, supportive of emotional expression, and using emotions as opportunities for intimacy and teaching. They may also include elaborative reminiscing, in which parents discuss past events with their child, acknowledging and validating the emotions experienced. In both emotion coaching and elaborative reminiscing, questions are asked about, or references made to emotions, and emotions are labelled, discussed and validated.

Meta-analysis showed supportive parental ESBs to be inversely related to conduct problems. Effect sizes were small but significant. Moderator analysis showed that effects were stronger at younger ages and for processing of negative emotions (e.g., sadness, anger or fear). Authors note that current evidence does not suggest that emotion coaching interventions are superior to social learning interventions for conduct problems. Effect sizes were smaller than those generally found for social-learning-based parenting practices. They suggest that, since these two approaches probably operate on different mechanisms of change, there would be benefit in integrating them. They recommend that parents use emotion coaching at times both parent and child are calm, limiting talking during times of high emotional arousal. At times of aggression or other unacceptable behavior, parents could use effective limit setting interventions such as time-out, but use them in a way that is not harsh, punitive or rejecting.

In their meta-analytic review of components associated with parent training program effectiveness, Kaminsky and colleagues (Kaminski, Valle, Filene, & Boyle, 2008) examined parent-child communication and other interventions such as time-out, in relation to child externalizing behaviors (e.g., noncompliance; aggression; hyperactive behavior) in children up to 7 years of age. Communication components of parenting programs typically included instruction for parents on emotional communication skills, such as active listening (which includes reflecting back what the child has said) and helping children to identify and appropriately express their emotions. They were also taught to reduce negative communication, such as criticism and sarcasm. Meta-analysis results showed that teaching parents emotional communication skills was consistently associated with larger positive effects at immediate post-test for parenting behaviors and skills, but not for child externalizing behaviors. This echoes Johnson and colleagues (2017) findings above, that these skills do not have as strong an effect on externalizing behaviors as behavioral skills such as time-out (Kaminski et al., 2008) and suggests that, used alone, emotional communication skills should not be expected to be enough to address such behavior.

Staff-patient communication was examined in two reviews. One found that empathic staff-patient communication (in 2 relevant studies) reduced child fear-related behaviors and increased their co-operation during dental procedures (Zhou, Cameron, Forbes, & Humphris, 2011). The other was a review of qualitative studies focusing on the experiences of children and adolescents with disabilities or chronic health conditions in hospitals in the UK and Canada (Shilling, Edwards, Rogers & Morris, 2012). Findings included that children expressed the desire to be included in discussions regarding their treatment, and that good communication with staff helped them feel less anxious and more respected.

3.3 Comments

The above evidence shows that good adult-child communication has a number of important long-term outcomes for children and adolescents. While it may not be enough as a stand-alone intervention for challenging behavior, it seems an essential skill for any caregiver.

Considering the importance of this skill, there are some significant gaps in the literature. No reviews were found on teacher-child communication. No reviews were found examining components of communication such as active listening or open-ended questions. No reviews were found on the immediate effects of good communication, or its components such as active listening. For example, there are no systematic reviews on the immediate effects of adult listening on child emotions; effects of listening in crisis situations involving aggression or dysregulation, or effects of adult listening when dealing with moments of child resistance or lack of co-operation. In the course of the first round of screening for this paper, a Swedish study was found on active listening as comforting communication for crying children (Lisper & Nilsson, 1982), showing strong effects of active listening in comparison to other strategies. A systematic review of studies like this, which examine immediate effects of listening, would be a valuable addition to the literature.

Listening and empathy have been found to be key components of de-escalation in violent and aggressive situations with adults (Price & Baker, 2012) but no reviews were found addressing listening or other de-escalation tools for children or adolescents. When we consider that discipline situations often involve dysregulation, anger and other heightened emotions, and that the behavior that may need containing may be aggressive or violent, it is clear, that this is a serious gap in the literature.

4. Communication: Teaching children to communicate better

4.1. Augmentative and Alternative Communication (AAC)

4.1.1. Description

Challenging behavior can be seen as a form of communication (Carr & Durand, 1985). Thus, one way to target challenging behavior is by helping children to communicate better. AAC methods are communication methods used to supplement or replace speech or writing for children and adolescents with communication or language impairments. Examples are gestures; manual signs; communication boards or electronic speech-generating devices.

4.1.2. Review evidence

Two included reviews examined the effects of AAC on appropriate behaviors and inappropriate behaviors among children and adolescents with disabilities. One showed that AAC intervention decreased challenging behavior for children and adolescents of varying ages and disabilities (Walker & Snell, 2013). The other (Sigafoos et al., 2008) showed increases in appropriate behaviors and decreases in inappropriate behavior for deaf-blind students, however evidence from the three relevant studies was classified as inconclusive because of methodological weaknesses.

4.1.2. Comments

Evidence from the above reviews suggests that enabling children with communication impairments to communicate through AAC has positive effects on their behavior.

4.2. Picture Exchange Communication System (PECS)

4.2.1. Description

PECS is a system involving pictures used to enable individuals, who struggle with spoken language, to communicate. For example, a child may be taught to give a picture of a desired item to an adult.

4.2.2. Review evidence

One review examined PECS (Wong et al., 2015), showing that PECS was effective for teaching social skills, communication and joint attention to children and adolescents with ASD, and meets criteria for classification as an evidence-based practice, according to What Works Clearinghouse guidelines.

4.2.3. Comments

Enabling children and adolescents with ASD to communicate better through PECS has been shown to have positive effects on their social behavior.

4.3. Functional Communication Training (FCT).

4.3.1. Description

FCT involves replacing a problem behavior with an appropriate communicative response that achieves the same result for the participant, but more efficiently (requiring less effort than the problem behavior), thus making the challenging behavior obsolete (Carr & Durand, 1985; Durand & Moskowitz, 2015). For example, children may be taught to ask for attention, help or a break in a respectful and appropriate way, instead of trying to attain these through challenging behaviors such as tantrums or aggression. To do this, the function or purpose of each child's challenging behavior must be determined, then the child can be taught an appropriate communicative response to replace the challenging behavior. After this, differential reinforcement can be used (providing function-based reinforcement for the appropriate communicative response, while withholding reinforcement for challenging behavior (extinction).

4.3.2. Review evidence

Five included reviews examined FCT, while several more with similar results were excluded because of overlap. The first review (Gerow, Davis, Radhakrishnan, Gregori, & Rivera, 2018a) demonstrated that there is a large body of good quality evidence showing that FCT is effective in reducing challenging behavior for school-age children and adolescents with disabilities. This review showed that FCT can be classified as an evidence-based practice for children with ASD, ID, other health impairments, and multiple disabilities. Results also showed that FCT can be effectively implemented by researchers, school personnel, and parents to reduce challenging behavior for children with disabilities. It is effective across settings and different types of challenging behavior. Results show that FCT is effective in reducing challenging behavior maintained by attention, escape and access to tangible items. There was not sufficient

evidence to support its use for automatically maintained challenging behavior. Evidence supports the use of FCT with extinction, but in cases where the use of extinction is not possible, it can be tried without extinction as this has been effective for some participants.

Gerow et al. (2018b) examined parent-implemented FCT and found that it was effective in reducing challenging behavior in children with ASD. In some cases, maintenance, and generalization to new settings and other implementers, was also shown. Social validity evaluation showed that parents rated the intervention positively, that it targeted socially important outcomes and made a significant difference. Parents found the intervention feasible and effective, and indicated that they were likely to continue using it.

McKenna et al. (McKenna, Flower, & Adamson, 2016) found a decrease in negative behaviors with use of FCT and gave it a WWC rating of "promising" for decreasing negative behavior for children (mostly boys) age 1-12 receiving special education services for EBD, serious emotional disturbance, ADHD and LD.

FCT was one of the interventions found to be effective as an individualized PBS intervention for negative behaviors, often severe, that had not responded to 1st or 2nd tier PBS interventions among children and adolescents with and without disabilities in school settings (Goh & Bambara, 2012).

A review looking at maintenance and generalization of FCT results (Neely, Garcia, Bankston, & Green, 2018) found that the majority of studies showed positive results for maintenance and/or generalization, supporting FCT as an evidence-based intervention for children and adolescents with developmental disabilities.

4.3. Comments

The above reviews on FCT show strong evidence that replacing challenging behavior by teaching children and adolescents to communicate their needs appropriately is a highly effective intervention. In popular literature (e.g., Gray, 2011), parents are commonly advised to tell children what to *do* rather than what *not* to do, i.e., to identify the purpose of a challenging behavior and to teach the child appropriate ways to achieve that purpose. It is likely that this advice has its origin in behavioral interventions teaching replacement behaviors, such as FCT. Although no reviews were found addressing FCT used by parents with typically developing children, the strength of evidence gleaned using this intervention for children with disabilities would suggest that it could be highly effective in more typical situations.

The approach taken by the current research is similar to the approach taken by FCT and other interventions teaching replacement behaviors: Instead of saying “don’t hit children” we recognize that caregivers and teachers are using corporal punishment to achieve certain outcomes. To address this problem behavior, we are making information available on evidence-based alternatives that have been shown to achieve the desired outcomes far more efficiently, a step towards making corporal punishment obsolete.

5. Cost

5.1. Response cost

5.1.1. Description

Introducing a cost for problematic behavior is one way of setting up the environment so that it puts children and adolescents in the best position to behave well. There are different ways of doing this. Response cost is a behavioral term usually referring to a deduction of reward, such as token or point, for problem behavior (Luman, Oosterlaan, & Sergeant, 2005).

5.1.2. Review evidence

Four included reviews examined response cost. The first examined response cost as an intervention for children and adolescents, gr K – 12, in school or classroom settings. Response cost was associated with decrease in swearing, aggression and inappropriate behavior (Simonsen et al., 2008). The remaining three reviews examined response cost for participants with ADHD. The first grouped response cost with other consequence-based classroom interventions in the meta-analysis. Consequence-based interventions reduced off-task and disruptive classroom behavior, and showed stronger effects than antecedent interventions (Gaastra et al., 2016). Luman, Oosterlaan and Sergeant (2005) reported that reward and response cost had positive effects on task performance and levels of motivation for children with ADHD and non-ADHD controls. The effect on task performance was somewhat more prominent in participants with ADHD. Response cost was as effective as reward, and authors concluded that it is a useful method to improve task performance in children with ADHD (Luman et al., 2005). However, a meta-analysis examining inhibitory control in children and adolescents with ADHD found that there were stronger effects in studies using reward without response cost (Ma, van Duijvenvoorde, & Scheres, 2016).

5.1.3. Comments

No reviews were found examining response cost used by parents or caregivers in typical home situations. While it is clear that response cost can be effective in reducing inappropriate behavior, there would seem to be a difference in using it as a punishment (Ma et al., 2016), or as a cost which can be incurred by choice as described by Gendreau et al. (2014) (see token economy), who give the example of inmates choosing whether to attend a class, or pay in some tokens to excuse themselves. It is possible that these different approaches would elicit different responses from participants. No reviews were found examining outcomes in relation to this distinction, however, price interventions, discussed below, can shed some light on the effects of the latter approach (cost involving choice).

5.2. Price interventions

5.2.1. Description

Price interventions seek to influence behavior by manipulation of the price of an item, or of other kinds of cost such as how much time something takes.

5.2.2. Review evidence:

Three public health reviews examined price of food items in relation to healthy or unhealthy eating among children and adolescents. The first found that price reduction on healthy items sold at school, or provision of free fruit resulted in significant increases in sales and consumption of healthier food (Jaime & Lock, 2009). A second review (Jensen, Hartmann, de Mul, Schuit, & Brug, 2011) examined studies in which prices at school cafeterias and vending machines were manipulated so that there were higher prices for unhealthy items, while healthy items were low-cost or free. There were also simulation experiments, in which participants were given a budget and told to allocate the amount between different foods. Price incentives were effective in altering choice of items and increasing fruit and vegetable consumption in school settings. Participants in experimental simulations also showed significant price sensitivity, an effect shown in one study to be stronger when the budget was smaller. The effects of free school fruit and vegetables on student's intake of fruit and vegetables were sustained for 1 year and 3 years post intervention in two studies that examined maintenance. A review of qualitative studies (Shepherd et al., 2006) showed that adolescents themselves identified reduced cost of healthy snacks as a facilitator of healthy eating and higher cost as a barrier to healthy eating.

A meta-analysis examined price interventions in relation to smoking, evaluating population-based policies or other interventions increasing taxes or prices on tobacco products (Wilson et al., 2012). Increases in tobacco price were shown to reduce smoking prevalence

among adolescents, with a 1–14% decrease in smoking prevalence for every 10% increase in price. Significant effects were found for initiation, prevalence and cessation of smoking. Authors noted larger effects for adolescents, as compared with adults, which is consistent with prior evidence that adolescents are more price sensitive. This is likely due to lower levels of disposable income, an effect also noted above by Jensen et al. (2011), in relation to pricing of food items. Strength of evidence was classified as "high", indicating high confidence that the evidence reflects the true effect, and very low chance that further research would change the result.

One review (Kessler, 2016) included 2 studies examining time efficiency incentives in the form of express lines at the cafeteria for healthy food only. Put another way, this introduced a cost, in terms of time, for less healthy food. Time efficiency incentives were associated with increased selection of healthy food items and decreased consumption of less-healthy food.

5.2.3. Comments

There is very constructive evolution in behavioral science, away from the use of aversive methods and punishment, towards interventions that teach appropriate behaviors (Heath, Ganz, Parker, Burke, & Ninci, 2015) or adjust the environment rather than punish the person (Horner, 2000). Response cost tends to be acknowledged as effective, but categorized as a punishment (e.g., Heath et al., 2015). The public health studies discussed above use cost as an adjustment of the environment, rather than as punishment. Their outcomes suggest that cost interventions could be particularly effective for children and adolescents, because they have less income than adults.

Studies or a review which examine how cost is framed would be a useful addition to the literature. For instance, children may respond differently to: "Your room is untidy, I'm taking away two stars," vs "We can pick up after you, but we charge for our services at 50c per item."

In the latter case, the child must make a decision about whether to incur the cost, rather than simply accept it as a fine. The use of cost is shifted from punitive consequence, to antecedent intervention. Comparative studies on these approaches would be useful.

6. Distraction

6.1. Response Interruption and Redirection (RIRD)

6.1.1. Description

Response Interruption and Redirection (RIRD) is a behavioral intervention which uses distraction. It involves using a distractor such as a prompt or comment to interrupt the child from engaging in the target behavior, and redirecting them towards a more appropriate, alternative behavior (such as appropriate language, or, for pica, throwing a non-food item in the trash). RIRD is used predominantly to address behaviors that are repetitive, stereotypical or self-injurious. These behaviors are usually maintained by sensory reinforcement, rather than attention or escape, and are often resistant to other interventions.

6.1.2. Review evidence

Two included reviews examined this intervention for children and adolescents with ASD (Lydon, Healy, O'Reilly, & McCoy, 2013; Wong et al., 2015). Lydon and colleagues (2013) reported large decreases in challenging behavior, and some increase in appropriate behavior, but noted that the intervention did not result in behavioral suppression. Wong et al. (2015) found that RIRD was effective, and that it meets criteria for classification as an evidence-based practice (WWC 5-3-20 guidelines) for children and adolescents with ASD.

6.1.3. Comments

The above evidence shows that RIRD is an effective intervention, however no reviews were found examining RIRD used with children without ASD.

6.2. Distraction

6.2.1. Description

By far the majority of evidence on distraction as an intervention for children and adolescents comes from medical literature, which makes sense when one considers how often doctors, nurses and dentists need to support children and adolescents through anxiety-provoking, uncomfortable or painful procedures. In medical settings, distraction involves drawing the child's attention away from a painful or distressing stimulus and toward something else.

6.2.2. Review evidence

Seventeen included reviews examined distraction to reduce procedure-related pain, anxiety or distress (Bice & Wyatt, 2017; Birnie, Noel, Chambers, Uman, & Parker, 2018; Cepeda, Carr, Lau, & Alvarez, 2006; Chorney, Twycross, Mifflin, & Archibald, 2014; Davidson et al., 2016; DeMore & Cohen, 2005; Kenney & Milling, 2016; Klassen, Liang, Tjosvold, Klassen, & Hartling, 2008; Kleiber & Harper, 1999; Koller & Goldman, 2012; Landier & Tse, 2010; Lassetter, 2006; Leão Goettems et al., 2017; Manyande et al., 2015; Oliveira & Linhares, 2015; Pillai Riddell et al., 2015; Wente, 2013), sixteen in medical or dental settings, and one examining distraction used by parents at home, to manage their children’s post-operative pain (Chorney et al., 2014). Most reviews examined a variety of distraction techniques, such as verbal distraction, story via headphones, video, virtual reality, musical, games, toys, books, bubbles etc. Two reviews focused specifically on music distraction (Cepeda et al., 2006; Klassen et al., 2008), and one on virtual reality distraction (Kenney & Milling, 2016). Distraction was tested across a wide range of ages and medical procedures, from routine procedures such as immunizations to more seriously painful and invasive procedures such as burn treatment or bone-marrow aspiration. All reviews reported positive results.

It is important to note that there is a difference between clinically significant and statistically significant results (Cepeda et al., 2006; DeMore & Cohen, 2005), and not all results were clinically significant, suggesting that distraction should not be used as a primary method of pain relief for more painful procedures. In addition, Pillai Riddell et al. (2015) note the dependence of infants and young children on the caregiver for regulation of distress, and caution that the use of distraction during early childhood should not interfere with a young child's core developmental need for proximity to the caregiver during times of pain-related distress. However, results of these reviews would suggest that distraction does make a meaningful difference in many cases, and has been found in some cases to decrease the need for medication (Chorney et al., 2014; Wente, 2013).

Distraction has been rated as effective and beneficial by children, parents and medical staff (Wente, 2013). An interesting result from one of the studies reviewed by Lasseter (Lassetter, 2006) was that distraction was the most common self-initiated, non-pharmacological pain-relieving method, with 98% of children in that sample using it for themselves.

In addition to measures of pain, anxiety or distress, 2 reviews included measures of co-operation or decrease in disruptive behavior (Leão Goettems et al., 2017; Manyande et al., 2015). The number of included studies addressing co-operation in these two reviews was limited, with one review citing positive results from 2 studies (Leão Goettems et al., 2017) and the other citing only 1 study, which did not find effects on co-operation. Reliable conclusions about the effects of distraction on co-operation or decreasing challenging behavior cannot be drawn based on so few studies, which is a pity given that this would be closer to the way parents and other caregivers would use distraction in every-day life. We can conclude, however, that distraction

reduces distress-related behavior (Bice & Wyatt, 2017; Kleiber & Harper, 1999), which may be challenging, and it is thus certainly a valuable addition to the toolkit.

6.2.3 Comments

The evidence reviewed here shows that distraction is a well-tested intervention in medical settings, with positive effects on pain, anxiety and distress, low in cost (Kleiber & Harper, 1999), with no harmful effects reported in any review. An obvious gap in the literature, however, is the lack of reviewed evidence on distraction used by parents and caregivers to address challenging behavior in more typical situations. Although parents and caregivers are often advised to use this intervention, especially with young children, no reviews were found addressing distraction used in this way.

Distraction is used in medical settings based on the premise that, because people have limited attentional capacity, a task which occupies some portion of their attention leaves fewer cognitive resources available to focus on the pain (Kenney & Milling, 2016). This premise could apply when distraction is used by caregivers or teachers in non-medical settings: i.e. that the fun involved in a distraction such as a game or quiz would occupy space in the child's attention that would otherwise be focused on the unpleasantness of the task at hand, such as tiding up, eating certain vegetables or doing sums. This may increase co-operation and decrease resistance, but this has yet to be examined in a systematic review or meta-analysis.

7. Extinction

7.1. Extinction: General

7.1.1. Description

Extinction is a strategy used to reduce or eliminate challenging behavior. It relies on accurate identification of the function of a challenging behavior, i.e. what makes the behavior rewarding for the child. Once this is known, the reward is withdrawn. For example, if a child engages in disruptive behavior because they want attention, the reward of attention can be removed by ignoring the behavior. This is often called planned ignoring. If a child has tantrums to escape a certain task, the reward of escape can be removed, by preventing escape when the child tantrums, which is called escape extinction. Extinction is often a component of interventions such as Functional Communication Training and differential reinforcement.

7.1.2. Review evidence

One review (Seubert et al., 2014) examined escape extinction in relation to food selectivity and food refusal, finding it effective for both. Effects were often enhanced by adding antecedent interventions.

Two reviews examined extinction in school contexts. Planned ignoring, in combination with other strategies (e.g., establishing rules and praising appropriate behavior) was found to be associated with increases in appropriate social and study behavior (Simonsen et al., 2008). Extinction was one of the interventions found to be effective as an individualized PBS intervention for negative behaviors, often severe, that had not responded to 1st or 2nd tier PBS interventions among children and adolescents, with and without disabilities, in school settings (Goh & Bambara, 2012).

One review examined extinction as an intervention for challenging behavior among children and adolescents with ASD (Wong et al., 2015), finding that it was effective and meets criteria for classification as an evidence-based practice (WWC 5-3-20 guidelines) for children and adolescents with ASD. Authors note that an initial increase in the challenging behavior (called an "extinction burst") may occur before the behavior is reduced or extinguished. They suggest that extinction should not be used in isolation, but with other interventions such as reinforcement and teaching replacement behaviors.

7.1.3. Comments

Taken together, the above research suggests that extinction is an effective intervention. More research is needed, however, on extinction used by caregivers in more typical situations.

7.2. Extinction for sleep problems

7.2.1 Description

Extinction has been used for sleep problems, such as bedtime problems (e.g., bedtime stalling; verbal protests; crying; clinging; refusing to go to bed; getting out of bed; attention-seeking; multiple requests for food, drinks, or stories) or night waking, night waking with violent tantrums, or co-sleeping. Night waking is common in children who rely on sleep onset association such as rocking, feeding or parental presence, and are unable to fall asleep again without these, if they wake at night (Mindell, 2006). Three kinds of extinction were examined in included reviews: standard extinction, graduated extinction and extinction with parental presence.

Standard or unmodified extinction (Mindell, 2006; Vriend, Corkum, Moon, & Smith, 2011), commonly known as the "cry it out" approach, involves the parents putting the child to bed at a designated time and then avoiding or minimizing interaction, and ignoring all crying, tantrums, or calling for parents, until a set time the next morning, (while continuing to monitor for illness, injury or any danger). Parents must implement this consistently, i.e. ignore their child's cries every night and no matter how long the crying lasts, to avoid teaching the child that longer crying is what is needed to get a response. It has been noted (Mindell, 2006) that this is a distressing intervention for parents and children, and that many are unable to ignore the crying long enough, or to implement with consistency.

Graduated Extinction procedures (Mindell, 2006), commonly known as "sleep training", were developed as an alternative to standard extinction, to avoid extended periods of child crying. There are different techniques. Typically, parents ignore bedtime crying and tantrums for specified periods between check-ins with the child. Parents can use a fixed schedule between

check-ins (e.g., every 5 minutes) or progressively longer intervals (e.g., 5 minutes, 10 minutes, then 15 minutes) across successive checks on the same night or across successive nights. The check-in involves the parents comforting their child for a brief period (e.g., 15 seconds to a minute), while minimizing interactions that could reinforce attention-seeking behavior. In some cases, gradual removal of parent attention or proximity is used, without a formal check-in procedure. The goal of graduated extinction is to enable the child to develop self-soothing skills so that they can fall asleep independently.

Extinction with parental presence (Mindell, 2006) is another variant to unmodified extinction in which the parent stays in the child's room at bedtime, but ignores the child and their behavior. The theory behind this is that, because some parents find this approach more acceptable, they would be more able to be consistent, which is important for the success of the intervention.

7.2.2. Review Evidence

Two included reviews examined different forms of extinction in relation to sleep problems. One review focused on children, age 3 to 7 with ASD (Vriend et al., 2011), the other on typically developing children age 0-4 with sleep problems (Mindell, 2006). Both reviews reported positive results for standard extinction. Vriend et al. (2011), reviewing SCDs, found improvements in self-settling and co-sleeping, less bedtime disturbances, and decrease in night waking with improvements maintained at 6-month or 12-month follow-ups. It was noted, however, that standard extinction may result in a temporary increase in negative behaviors, known as an extinction-burst, which can cause a great deal of distress for the child and parents. Mindell (2006) found standard extinction highly successful in 17 of 19 studies (RCTs and prospective designs). It was effective for bedtime problems and night waking, and strongly

supported by controlled group studies. Maintenance of treatment effects was also shown. In two studies, parents reported improvements in their children's daytime behavior after the intervention. No adverse secondary effects were reported, but, as mentioned earlier, it was noted that this is a stressful intervention for parents.

All 19 studies (RCTs and prospective designs) on graduated extinction (Mindell, 2006) reported positive outcomes, and a number of studies demonstrated maintenance of treatment effects over time. The intervention was effective for bedtime problems and night waking, and strongly supported by controlled group studies. No adverse secondary effects were reported. Aside from better sleep, there were other improvements in child and family well-being, such as that infants were less irritable, cried and fussed less, and parents reported improvements in their children's daytime behavior. After the intervention, parents reported rapid and dramatic improvements in their overall mental health, fewer symptoms of depression, improved marital satisfaction and reduced parenting stress.

Extinction with parental presence was examined in 4 studies (2 RCTs and 2 prospective designs) and was successful in all of them (Mindell, 2006). No adverse secondary effects were reported. Aside from better sleep, other improvements in child and family well-being included: improvements in the children's daytime behavior and fewer symptoms of depression reported by parents.

7.2.3. Comments

Standard extinction, although effective, is distressing for children and caregivers, and thus difficult to implement with the consistency needed for success. The above research suggests that it is not necessary to use standard extinction for sleep problems, since gentler versions seem to work as well. Choosing a gentler intervention makes sense not only to minimize distress, but

also because it increases the likelihood that the intervention will be implemented consistently and therefore be successful.

8. Feedback on behavior

8.1. Feedback: General

8.1.1. Description

Participants are provided with data (e.g., charts, graphs, reports) systematically tracking their performance in certain target behaviors.

8.1.2. Review evidence

Two reviews, one from the field of classroom management and one from public health, examined feedback as an intervention. Simonsen et al. (2008) examined performance feedback as an intervention to increase appropriate and decrease inappropriate classroom behavior. Students were provided with charts, graphs or reports systematically tracking their performance in positive or negative target behaviors. Teachers specified behavioral goals and rewards if these were met. In the five relevant studies, feedback was associated with outcomes such as: class-wide increase in appropriate behavior; decrease in inappropriate behavior; decrease in transition times; increase in prosocial and academic behaviors. The other review (Hynynen et al., 2016) addressed physical inactivity and sedentary behavior among older adolescents in school settings. Feedback on behavior was one of the interventions identified as effective in increasing physical activity. No detail was provided on how the feedback was given.

8.1.3. Comments

The above evidence suggests that feedback on behavior is an effective intervention.

8.2. Daily Behavior Report Cards

8.2.1. Description

Daily behavior report cards are frequently used alone, or as components of second-tier interventions such as Check In Check Out (CICO) in schools using tiered systems such as Positive Behavioral Interventions and Supports. Second-tier interventions target students needing more support than is offered by the more universal, first-tier interventions. This intervention would not be used for the whole class, rather for the few students who frequently engage in off-task, disruptive or inappropriate behavior after the rest of the class has settled. Such students would carry a daily report card via which they would receive teacher feedback on certain behaviors in every lesson. They would usually check in with a teacher or mentor at the beginning of each day to receive that day's report card, and to set goals. At the end of the school day they would check out with the same adult to review their progress. Ideally, caregivers would also be involved, reviewing and signing the report card each day and providing encouragement and praise. Consequences such as rewards for meeting goals are often but not always part of the intervention.

8.2.2. Review evidence

Eight included reviews examined interventions using daily report cards for school children with and without disabilities from preschool to high school (Cox, 2005; Gaastra et al., 2016; Hawken, Bundock, Kladis, O'Keeffe, & Barret, 2014; Pyle & Fabiano, 2017; Richardson et al., 2015; See, Gorard, & Torgerson, 2012; Vannest, Davis, Davis, Mason, & Burke, 2010; Wolfe et al., 2016). Four of these focused specifically on children and adolescents with or at risk for ADHD (Gaastra et al., 2016; Pyle & Fabiano, 2017; Richardson et al., 2015). The others focused on children with behavior problems or emotional and behavioral difficulties. The most

common target behaviors were off-task or disruptive behaviors (e.g., talking out; out of seat; aggression; inappropriate vocalizations).

All eight reviews showed positive results, with strong and consistent effects found across age, gender and target behaviors. One meta-analysis found that high levels of parent involvement and broad use throughout the day were associated with stronger intervention outcomes (Vannest et al., 2010), while another found that home-school communication did not moderate results (Pyle & Fabiano, 2017). One review found positive effects on drop-out and completion rates and school engagement (See et al., 2012).

The function of problem behavior was found to play a key role in the effectiveness of basic CICO. Strong effects were demonstrated for attention-maintained problem behavior while (unless modified) it was ineffective for escape-maintained problem behavior (Wolfe et al., 2016).

Where social validity was measured, staff, parents and students indicated a high level of satisfaction with CICO, finding that it was easy to implement and produced meaningful results (Hawken et al., 2014; Wolfe et al., 2016). When compared to contingency management, self-regulation and antecedent interventions, DRC was the only intervention which scored consistently positive teacher ratings of effectiveness and acceptability (Richardson et al., 2015).

The daily report card has been found to be effective as a stand-alone intervention for students with ADHD (Pyle & Fabiano, 2017; Richardson et al., 2015), and CICO can be considered an evidence-based practice for students with problem behavior maintained by adult attention (Wolfe et al., 2016).

8.2.3. Comments

Taken together, the results of these reviews suggest that daily report cards are a highly effective intervention for school children of all ages needing behavioral support beyond the basic or universal classroom interventions.

9. Goal setting

9.1. Description

Goal setting involves clear goals set with or for participants.

9.2. Review evidence

Three reviews addressed goal setting as an intervention for behavior change. One examined goal setting as an intervention for students, with and without disabilities, who had persistent and documented behavior problems in school settings. (Bruhn, McDaniel, Fernando, & Troughton, 2016). All included studies reported positive outcomes. Students reported greater satisfaction with the intervention and were more likely to attain their goals, when they were directly involved in setting them, rather than having the goals dictated to them by an adult. Results should be interpreted with caution, however because of the relatively low methodological quality of this review. A meta-analysis (Epton, Currie, & Armitage, 2017) reviewed RCTs to determine the unique effects of setting goals on behavior change among children and adolescents with and without disabilities, mostly in school settings. Behaviors targeted for change were diverse, including educational; sport; motor function (for children with cerebral palsy) and health behaviors. Goals could focus on behavior (e.g., study for 1 hour per day) or outcomes (e.g., achieve above a certain percentage in a test). They could be set by the participant or set for them by someone else. Results showed a small, positive, unique effect of goal setting across a range of behaviors. Another meta-analysis (Hynynen et al., 2016) addressed physical inactivity and sedentary behavior among older adolescents in school settings. Goal-setting was one of the interventions identified as effective in increasing physical activity.

9.3. Comments

The evidence above suggests that goal setting has a positive effect on behavior. No reviews were found addressing use by caregivers at home.

10. Graduated exposure

10.1. Description

Graduated exposure involves hierarchical exposure to feared stimuli e.g., for needle procedures: sitting in the waiting room; then seeing a syringe without a needle; then seeing a syringe with a needle; then holding a syringe with a needle; then holding the tip of a needle against their arm, and eventually having an injection.

10.2. Review evidence

Two reviews examined graduated exposure as an intervention for children and adolescents with fears and phobias. McMurtry et al. (2015) found the intervention effective in reducing specific fears. Other outcomes included increased compliance, child and parent satisfaction. Lydon et al. (2015) reported that all studies showed reduction or elimination of the targeted fear or phobia for children and adolescents with ASD, as well as decrease in, or elimination of, challenging behavior. Where reported, maintenance and social validity (parent satisfaction) were also shown. Based on the Chambless and Hollon (1998) criteria this intervention can be classified as empirically supported for children and adolescents with ASD (Lydon, Healy, O'Callaghan, Mulhern, & Holloway, 2015).

10.3. Comments

The reviewed evidence above suggests that this intervention is effective for fears and phobias. It is possible that graduated exposure could be useful to caregivers in other ways, such as increasing the range of food items eaten by a picky eater (rewarding first for allowing the new

vegetable on the plate, then touching it, then smelling it, then licking it, and eventually eating it). However, no reviews were found addressing graduated exposure used in this way.

11. Modelling

11.1. Modelling: General

11.1.1 Description

Modelling involves an adult or peer demonstrating a target behavior in the hope that the child will imitate and eventually acquire that behavior.

11.1.2. Review evidence

Modelling was addressed in four reviews. A meta-analysis (Vartanian, Spanos, Herman, & Polivy, 2015) was conducted of experimental and correlational studies on modelling of food intake. In experimental studies, children were paired with models while eating snacks. Models were live or remote, adult or (mostly) peers, familiar or strangers, and ate a lot or a little. Outcomes showed large modelling effects: children ate more when their companion ate more, and less when their companion ate less. Age was positively correlated with the magnitude of the modelling effect i.e. older children were more likely to be influenced by portion size than younger children. Authors concluded that modelling is a robust and powerful influence on food intake.

Lydon et al. (2015) examined modelling as an intervention for fears, phobias and associated challenging behaviors (e.g., screaming; crying; elopement; attempts to elope; self-injury; aggressive behavior; property destruction or misuse; tantrum behaviors) among children with ASD. All five of the relevant studies showed reduction or elimination of the targeted fear or phobia and decrease in, or elimination of, challenging behavior. Most studies assessed maintenance with positive results; one study reported generalization across other settings; one study assessed social validity with positive outcomes for parent satisfaction with the interventions used. Authors concluded that this intervention can be classified as empirically

supported (Chambless & Hollon, 1998) for reducing fears and phobias and associated challenging behaviors for children with ASD.

Wong et al. (2015) examined modelling as an intervention addressing various target behaviors (social skills; communication; joint attention; play; school-readiness; academic skills; vocational skills) for children and adolescents with ASD. Modelling was defined as demonstration of a desired behavior, resulting in imitation and eventual acquisition of that behavior by the child. It was found to be effective for the listed target behaviors, and to meet criteria for classification as an evidence-based practice (WWC 5-3-20 guidelines) for children and adolescents with ASD.

The fourth review examined components of various interventions, in relation to prevention of delinquency, criminal offending, or recidivism among juvenile offenders and those at risk for antisocial or delinquent behavior. Meta-analysis found small but significant effects for programs containing behavioral modelling i.e. juveniles learning appropriate behavior through observing demonstrations by competent role models. Age, gender and ethnicity did not moderate results.

11.1.3. Comments

Taken together, the above reviews would suggest that modelling can be an effective intervention for a variety of target behaviors. Obvious gaps in the literature concern the use of modelling as an intervention in more typical situations (other than healthy diet) by parents and teachers.

11.2. Parental Modelling

11.2.1. Description

Parental modelling refers to behaviors engaged in by parents and observed by their children.

11.2.2. Review evidence

Fourteen included public health reviews addressed parental modelling in relation to various target behaviors. In most of these reviews, parental modelling would be more accurately described as a parenting factor, than an intervention. However, since parental modelling could also be used as a behavior change strategy (e.g., Nixon et al., 2012), it is useful to explore what effects have been found for it.

Eight reviews addressed parental modelling in relation to child or adolescent physical activity. Four found a positive association (Mitchell, 2012; Nixon et al., 2012; Webber & Loescher, 2013; Yao & Rhodes, 2015), but two of these caution about quality of evidence (Mitchell, 2012; Webber & Loescher, 2013), one found only a weak association (Yao & Rhodes, 2015), and the other did not present a direct association (Nixon et al., 2012). One review found mixed results (Edwardson & Gorely, 2010), and three found little or no evidence of effects (Ferreira et al., 2007; Sallis, Prochaska, & Taylor, 2000; Trost & Loprinzi, 2011). Three reviews found slightly stronger positive association for fathers' physical activity level than for mothers' (Edwardson & Gorely, 2010; Ferreira et al., 2007; Yao & Rhodes, 2015).

Seven reviews addressed parental modelling in relation to child or adolescent healthy or unhealthy dietary behaviors, such as consumption of fruit and vegetables, or unhealthy items such as fast foods or sugar-sweetened beverages (Mazarello Paes et al., 2015; McClain et al., 2009; Nixon et al., 2012; Pearson et al., 2009; Van Der Horst et al., 2006; Webber & Loescher,

2013; Yee et al., 2017). All found positive associations: parental modelling was consistently associated with healthy and unhealthy food consumption, in the same direction as the behavior modelled by the parents. In one review (McClain et al., 2009), a distinction was drawn between perceived modelling (by the child) of healthy eating by parents, and modelling reported by parents. Perceived modelling was a stronger predictor of child behavior, while modelling reported by parents was not consistently correlated with child dietary intake.

One review (Ryan et al., 2010) addressed parental modelling in relation to alcohol use, alcohol related problems during adolescence and problem drinking in adulthood. Parental modelling was defined as parent's alcohol consumption, and referred to adolescents and pre-adolescents learning drinking behaviors by observing them in their parents. All included studies were longitudinal. Meta-analysis results showed that parental modelling of drinking alcohol, was associated with earlier alcohol initiation and higher levels of later alcohol use.

11.2.3. Comments

Taken together, evidence for the effect of parental modelling on physical activity is weak. Also, none of the reviews mentioned controlling for activity level as a temperament factor (Chess & Thomas, 1986), which raises the question of whether the effects found were a result of parental modelling or in fact genetic inheritance of activity levels similar to the parent. Reviews did, however, show effects of parental modelling on healthy or unhealthy eating and alcohol use.

11.3. Video modelling

11.3.1. Description

Video modelling (VM) uses videos to provide a model of the target behavior. The video is shown to the participant, and this is usually followed by an opportunity to perform the target behavior. There are different types of video modelling: Video modelling other (VMO) involves a model other than the child performing the target behavior or skill. With video self-modelling (VSM), a video is made of the child successfully performing the target skill or behavior. This involves editing out mistakes, negative behavior or adult prompts. With Point-of-View video modelling (POV), the child is shown a video recorded from the perspective of the person carrying out the target behavior. Video Prompting is a form of video modelling in which, instead of watching a video of the whole task, the task is broken into steps. Participants watch a clip of each step and then perform each step before the next step is viewed.

11.3.2. Review evidence

Thirteen included reviews examined video modelling. Twelve reviews examined video modelling as a method to teach skills (e.g., self-help skills; independent living skills; social and communication skills; fluent speech; play skills; academic skills; on-task behavior etc) to children and adolescents, with ASD or developmental disabilities (Bellini & Akullian, 2007; Bennett, Aljehany, & Altaf, 2017; Domire & Wolfe, 2014; Hong et al., 2016; Hong et al., 2017; Mason, Davis, Ayres, Davis, & Mason, 2016; Mason, Davis, Boles, & Goodwyn, 2013; Mason, Ganz, Parker, Burke, & Camargo, 2012; Wong et al., 2015), children and adolescents with emotional and behavioral disorders (EBD) and other disabilities (Baker, Lang, & O'Reilly, 2009; Clinton, 2016; Hitchcock, Dowrick, & Prater, 2003; Mason et al., 2016), and school children and adolescents without disabilities (Hitchcock et al., 2003). All found the intervention effective,

with moderate to strong effects. In addition to appropriate behavior and skills, six of the above reviews also examined video modelling in relation to challenging behavior, (e.g., out-of-seat; inattentive; fidgeting; distracted; off-task; argumentative; inappropriate; negative; disruptive; tantrum; aggressive; self-injurious) for children and adolescents with ASD, EBD and other disabilities, (Baker et al., 2009; Bellini & Akullian, 2007; Clinton, 2016; Hitchcock et al., 2003; Mason et al., 2016; Wong et al., 2015) or without disabilities (Hitchcock et al., 2003). All reviews reported positive results, with moderate to strong effects.

Video modelling has been found to be more effective as a stand-alone intervention than used as part of a package or with other interventions such as reinforcement, for children and adolescents with disabilities (Mason et al., 2016; Mason et al., 2013) Authors suggest this could be because the majority of studies were conducted with individuals with ASD. It is likely that presentation of other components increased social interaction with the interventionist, which would be more demanding for participants with ASD (Mason et al., 2016). Three reviews reported on maintenance and generalization, with positive results (Bellini & Akullian, 2007; Domire & Wolfe, 2014; Hitchcock et al., 2003). Social validity, where reported was also positive (Domire & Wolfe, 2014; Hitchcock et al., 2003). Video modelling meets criteria for classification as an evidence-based practice (WWC 5-3-20 guidelines) for children and adolescents with ASD (Hong et al., 2017; Wong et al., 2015). Specific types of video modelling have also been classified as evidence-based practices for children and adolescents with ASD, namely POV (Mason et al., 2013); VMO (Bellini & Akullian, 2007; Mason et al., 2012) and VSM (Bellini & Akullian, 2007).

All twelve of the above reviews were based on single case design (SCD) studies. By contrast, the thirteenth included review was a medical meta-analysis and included 2 RCTs on

video modelling as an intervention for needle related procedural distress in children aged 4 to 11 years (Uman, Chambers, McGrath, & Kisely, 2006). In both studies, children watched a video demonstration of positive coping behaviors during a mock procedure by another child or adult. Neither study found any reduction in distress. No data was reported about whether the children were more co-operative during the procedures.

11.3.3. Comments

The evidence reviewed above shows that video modelling can be highly effective across ages, disabilities, target behaviors and settings. It seems particularly well suited, and shows strong effects for, children and adolescents with ASD. It is thought that this is because individuals with ASD tend to be visual learners (Mason et al., 2013). It has also been suggested that video prompting is a promising instructional technique for individuals with ASD due to their deficits in short-term working memory (Domire & Wolfe, 2014).

Aside from Hitchcock et al. (2003) and Uman et al. (2006), no more reviews were found addressing children or adolescents without disabilities, which is perhaps the most obvious gap in the literature. It is possible that this intervention is relatively unknown to caregivers and teachers of typically developing children, but the small amount of reviewed evidence available (Hitchcock et al., 2003) would suggest that it has the potential to be a highly effective intervention for this population. With cellular phones, most caregivers and teachers now have easy access to video recording and editing technology. Video modelling could thus be a viable intervention for use by a wider range of people.

12. Monitoring

12.1. Parental monitoring

12.1.1. Description

Parental monitoring includes awareness of child whereabouts and activities and includes supervision, talking to parents of children's friends or information from other sources, including child disclosure.

12.1.2. Review evidence

Eleven reviews addressed parental monitoring in relation to various target behaviors. Parental monitoring could be described as a parenting factor rather than an intervention in these reviews, however, since increased parental monitoring could also be an intervention, it is useful to explore what effects it has been found to have.

Two reviews examined parental monitoring, such as supervision and talking frequently to parents of the adolescent's friends, in relation to sexual activity among adolescents of various ethnicities and SES (Commendador, 2010; Zimmer-Gembeck & Helfand, 2008). Both showed that higher parental monitoring was significantly associated with delay in age of first intercourse. One also found parental monitoring to be positively associated with contraception use (Commendador, 2010).

Two reviews examined parental monitoring in relation to cyberbullying among adolescents. The first, a meta-analysis, identified parental monitoring as a protective factor, significantly negatively related to adolescent involvement in cyberbullying as perpetrators or victims (Kowalski, Giumetti, Schroeder, & Lattanner, 2014). The other review (Elsaesser, Russell, Ohannessian, & Patton, 2017) reported similar findings, as well as some evidence suggesting that parental monitoring that occurs in the context of an open and warm parent-

adolescent relationship is more likely to be effective in reducing involvement in cyberbullying than restrictive monitoring alone.

One meta-analysis examined parental monitoring in relation to delinquency, including offenses such as threatening or assault with or without a weapon, murder, rape, shoplifting, pick pocketing, arson, vandalism and selling drugs, among children and adolescents of various races and SES (Hoeve et al., 2009). Parental monitoring, either active monitoring by parents, parental knowledge, or child disclosure, was relatively strongly inversely linked to delinquency, with the largest effect size for child disclosure.

One meta-analysis examined parental monitoring among other possible protective factors for adolescents exposed to violence in their communities (Ozer, Lavi, Douglas, & Wolf, 2017). Parental monitoring showed some (limited) evidence as a moderator for externalizing symptoms, but not for internalizing symptoms. In line with previous research, authors concluded that parental monitoring may be an important protective factor against exposure to violence, however it is not very influential as a moderator for symptoms once exposure to violence has occurred. Close, warm parent - child relationship was the strongest moderator of symptoms of exposure to violence.

Four reviews addressed parental monitoring in relation to alcohol or substance abuse among adolescents. Focus on parental monitoring was found to be a common ingredient of parenting programs showing positive effects in preventing, curbing or reducing adolescent substance use (alcohol tobacco and cannabis) (Kuntsche & Kuntsche, 2016). Focus on rule setting and parent-child communication were also important ingredients. Meta-analysis showed a robust link between parental monitoring and lower marijuana consumption in adolescents (Lac & Crano, 2009). More intense monitoring was associated with less adolescent marijuana use, with

close parental monitoring being associated with a 21% reduction of marijuana use. Larger effect sizes were observed in female-only samples (it is thought that parents tend to monitor girls more intensively), while minority-only status and age did significantly moderate results. Another meta-analysis found that parental monitoring was associated with delayed alcohol initiation and lower levels of later alcohol use (Ryan et al., 2010). Mynttinen et al. (2017) found that parental monitoring significantly discouraged alcohol consumption, preventing, or delaying onset thereof. The more parental supervision there was, the less alcohol adolescents consumed. There was also some evidence that adolescents with a high level of parental monitoring had stronger drinking refusal self-efficacy and experienced less peer pressure. As found by Kuntshe and Kuntshe (2016) above, authors note that parental monitoring interlinks with the two other aspects of parental involvement that decreased alcohol use: parental rules and parent-child communication (Mynttinen et al., 2017).

Three studies in a review addressing fruit and vegetable consumption among children and adolescents (Pearson et al., 2009) examined parental monitoring, with two of the three finding it was not related.

12.1.3. Comments

Although it may not help children to eat more fruit and vegetables, it is clear from the above reviews that parental monitoring is a very important factor in the prevention or reduction of some of the most dangerous and worrying adolescent behaviors. An obvious gap in the reviewed literature, therefore, is the use of increased parental monitoring as an intervention for problem behaviors, such as substance abuse and bullying, rather than simply as a protective factor. Increased monitoring has been used as an intervention in schools, with a good deal of success as can be seen in the next section.

The large effect size found for child disclosure in relation to delinquency suggests that good communication between parent and child is an important aspect of parental monitoring. Interventions teaching parents skills such as active listening and open-ended questions would make sense in relation to this finding.

12.2. Monitoring interventions in schools.

12.2.1. Description

Monitoring interventions in schools include active supervision, increased playground supervision and metal detectors. Active supervision is a kind of monitoring in which the teacher moves around, looking around, interacting with students, correcting any behavior inconsistent with expectations, and reinforcing good behavior.

12.2.2. Review evidence

Simonsen et al. (2008) found that active supervision had a positive impact on student behavior in classroom and other settings such as hallways, and during transitions. Improvements included class-wide decrease in minor behavioral incidents and higher levels of participation. An inverse relationship was found between the number of supervisor-student interactions and instances of problem behavior (Simonsen et al., 2008). These results should be interpreted with caution, however, as they were based on only three studies in a review of relatively low quality.

Farrington and Ttofi (2009) examined increased playground supervision among other program elements as an intervention for bullying among children and adolescents age 6 to 14. Their meta-analysis showed improved playground supervision to be one of the most important program elements associated with a decrease in bullying (Farrington & Ttofi, 2009).

A review examining the use of metal detectors in relation to school violence (Hankin, Hertz, & Simon, 2011) among children and adolescents found that there was insufficient evidence to draw conclusions about their effects, although in one study, students attending schools with metal detectors reported being less likely to carry weapons in, or on the way to, school.

12.2.3. Comments

The limited amount of reviewed evidence available on monitoring interventions in schools suggests that monitoring plays an important role in reducing problem behavior, from minor disruptiveness to more serious behaviors such as bullying.

13. Opportunities to Respond (OTR)

13.1. Description

Teacher Directed Opportunities to Respond (OTR or TD-OTR) is a classroom instructional strategy in which teachers increase opportunities for all students to respond, as opposed to the common situation, in which students raise their hands in response to teacher question and only one student is chosen to respond. Examples of OTR include response cards, choral responding, student response systems or clickers, unison hand gestures such as thumbs up or thumbs down, laminated boards with picture or response choices, boards with erasable markers.

13.2. Review evidence

Six included reviews examined OTR as an intervention to increase appropriate behavior and academic engagement or to decrease off-task, disruptive and other inappropriate behavior (Common et al., 2019; Fitzgerald Leahy, Miller, & Schardt, 2018; MacSuga-Gage & Simonsen, 2015; Owiny, Spriggs, Sartini, & Mills, 2018; Randolph, 2007; Sutherland & Wehby, 2001). A range of different OTR were employed across reviews with two focusing specifically on response cards (Owiny et al., 2018; Randolph, 2007). Across reviews it is clear, that OTR have been used effectively in a range of school settings with children and adolescents of different ages, ethnicities and levels of ability, typically developing and with disabilities or behavioral disorders. All reviews reported positive outcomes. Meta-analysis showed large positive effects on academic and behavioral outcomes across grade, ability and OTR type (Fitzgerald Leahy et al., 2018; Randolph, 2007). Effects were higher for elementary-aged students, and study quality moderated results slightly, with higher-quality studies showing larger effect sizes (Fitzgerald

Leahy et al., 2018). Social validity results from teachers and students were positive (Fitzgerald Leahy et al., 2018; MacSuga-Gage & Simonsen, 2015; Owiny et al., 2018).

According to Council for Exceptional Children's guidelines (Cook et al., 2014), teacher-directed OTR in K-12 school settings can be classified as a potentially evidence-based practice (Common et al., 2019). Response cards met Council for Exceptional children's criteria (Cook et al., 2014) for classification as an evidence-based practice for increasing active responding (Owiny et al., 2018).

13.3 Comments

OTR is a well-tested intervention with positive effects on challenging behavior, worth including as a universal strategy for classroom management.

14. Problem-solving together

14.1. Student participation

14.1.1. Description

Student participation refers to meaningful student involvement in collective decision-making at school. This may involve meeting as a class or in small groups to decide class rules, express views, or participate in school improvement. Meetings would usually involve discussion of school problems and brainstorming of solutions, the most constructive of which would later be chosen together and implemented.

14.1.2. Review evidence

Three reviews examined student participation in collective decision making at school. One reviewed qualitative studies focused on student involvement in school health promotion (Griebler, Rojatz, Simovska, & Forster, 2017). Student participation was defined as students having genuine influence over decisions and activities in school health promotion processes, such as collaboration in design, planning, implementation and / or evaluation of school health promotion measures. Narrative synthesis showed positive effects on students, such as increases in satisfaction, motivation, ownership, skills, competencies, knowledge and personal development. There were positive health-related effects, and positive effects on school culture, social climate, rules, policies and physical infrastructure. Positive effects on peer relationships and relationships between adults and students were also reported. A few studies reported negative effects for students, such as feeling they were not taken seriously, unmet expectations, or feeling overwhelmed by the responsibility.

Mager and Nowak (2012) reviewed quantitative and qualitative studies examining student participation in collective decision making at school, specifically involvement in

decisions that affected them as a group, rather than as individuals. This included student participation in councils; temporary working groups; class decision making and school decision making. Qualitative analysis showed moderate evidence of positive effects on life skills, self-esteem and social status, democratic skills and citizenship, student–adult relationships and school ethos. There was limited evidence of positive effects on academic achievement, facilities, rules / policies, and health. There were low levels of evidence of negative effects (e.g., student stress, disappointment or frustration) (Mager & Nowak, 2012).

Voight and Nation (2016), also reviewing both quantitative and qualitative studies, examined student participation in relation to school climate. Opportunities for students to be meaningfully involved in school included helping to decide class rules and expressing their views in class, participating in school improvement e.g., involvement in small groups meeting to discuss school problems and brainstorming solutions which they then enact or lobby for, or participation in student, parent and staff teams to improve school health. Moderate quality evidence showed that students who perceived having opportunities to participate meaningfully at school expressed a stronger sense of connection to school and more respectful teacher–student relationships. In schools where students participated in school improvement, students reported more positive relationships with teachers and peers, and higher perceptions of safety (Voight & Nation, 2016).

14.1.3. Comments

Family or class meetings in which parents or teachers and children problem-solve together, are part of the Adlerian approach and recommended by practitioners of positive discipline (e.g., Nelsen, 2011). As an intervention for challenging behavior, students could be involved in discussing problems (e.g., noise levels in class, late-coming, conflict in a certain

game in recess), brainstorming and then choosing and enacting solutions together. No reviewed evidence was found for this intervention specifically, but evidence from the three reviews above on student participation suggest class meetings would have positive effects. The above reviews suggest important benefits of student participation, however, more research is needed, to assess effectiveness as an intervention for problem behavior. No reviews were found examining problem-solving used at home.

14.2. Collaborative Problem Solving (CPS)

14.2.1. Description

In the Collaborative Problem Solving approach (Greene & Ablon, 2005), the adult attempts to solve the problem collaboratively with the child using the following process: The adult explores the child's concerns about a problem or issue. The adult states their concerns. The adult and child brainstorm solutions that will address both their concerns. The child is given the first opportunity to generate a solution. No solutions are dismissed outright. The adult helps the child to think through whether each solution addresses both of their concerns, and whether it is realistic and feasible. They agree on a solution, implement it and return to discuss whether it was successful. If not, they discuss further and try another solution until they have found one that works.

14.2.2. Review evidence

One review (Pollastri, Epstein, Heath, & Ablon, 2013) examined CPS used with children and adolescents in outpatient, inpatient psychiatric or school settings to address externalizing, oppositional, defiant or "out of control" behavior. Studies included one RCT and five pre/post designs. In each study, staff or parents were trained in the approach. Results in outpatient settings showed reduced oppositional behaviors, ADHD symptoms and parenting stress, and improved parent-child relationships. The RCT found that CPS was at least as effective as a behavioral parent-training model. Results in inpatient settings showed a dramatic reduction in use of restrictive interventions such as physical or mechanical restraints and locked-door seclusions, as well as a decrease in staff and patient injuries. Results in school settings showed significant reduction in disciplinary referrals and teacher stress. This review draws in part on unpublished findings, which were not referenced. Only findings from referenced, published studies are

included here. These should be interpreted with caution, as three of the review authors practice and consult in the CPS approach, and at least three of the six included studies were conducted by authors or developers of the approach.

14.2.3 Comments

The limited review evidence available for the CPS approach has shown important positive results addressing severe behavior, in challenging populations, and deserves more research.

15. Prompting

15.1. Description

Prompting involves various methods to assist or remind participants to engage in a target behavior. Prompts can be verbal, visual, gestural or physical, and are generally given as, or just before, the participant attempts to use a skill. Prompting is typically used as part of a package with other behavior management interventions such as reinforcement, and is considered a foundational applied behavior analysis technique (Wong et al., 2015). Prompts are often used systematically, in a hierarchy of least to most, or most to least intrusive prompts. An example of a least to most prompting hierarchy would be to proceed from visual to verbal to gestural to modelling to partial physical to full physical prompts. At each step the adult would only proceed to the next level as the child failed to respond to that level. Least to most prompting is commonly used to teach target behaviors, while most to least procedures are used to fade the use of prompts.

15.2. Review evidence

Six included reviews addressed prompting (Barton & Wolery, 2008; Jung & Sainato, 2013; Ledford & Wolery, 2011; Lydon et al., 2013; Warzak, Forcino, Sanberg, & Gross, 2016; Wong et al., 2015). All were narrative reviews. Five focused on children and adolescents with autism and other disabilities, and only one addressed typically developing children. Target behaviors for children with disabilities included play skills (Barton & Wolery, 2008; Jung & Sainato, 2013), imitation (Ledford & Wolery, 2011), social skills, communication, challenging behavior, joint attention, play, cognitive skills, school-readiness, academic, motor and adaptive skills (Wong et al., 2015). A specialized kind of prompting, response redirection, was used to

address stereotypy for children with autism (Lydon et al., 2013). Warzak et al. (2016) examined prompting as part of a rapid toilet training procedure for typically developing toddlers.

All reviews reported positive outcomes. Three also reported generalization (Barton & Wolery, 2008; Jung & Sainato, 2013; Ledford & Wolery, 2011). Wong et al. (2015) found prompting and time delay (a procedure used to fade prompting) to be evidence-based practices (WWC 5-3-20 guidelines) for children and adolescents with ASD (Wong et al., 2015).

15.3. Comments

Prompting is a well-known behavioral skill, often used as part of packaged interventions alongside other techniques. It is less common to find information on the unique effects of prompting. There are gaps in the reviewed literature concerning prompting used by caregivers and teachers in typical home and classroom situations.

16. Reinforcement

16.1. Reinforcement: general

16.1.1. Description

Reinforcement is defined as anything occurring after a participant engages in a desired behavior, that leads to the increased occurrence of that behavior in future. It is used to increase desired behaviors and to teach new skills. Reinforcement can be positive or negative. With positive reinforcement, the participant is awarded a desired item or activity after engaging in the target behavior. With negative reinforcement, something the participant does not like is taken away when they engage in the target behavior. Reinforcement is considered a foundational evidence-based practice in that it is so often used as part of, or in conjunction with, other evidence-based practices e.g., prompting or FCT. (Wong et al., 2015). There are different kinds of positive reinforcement e.g., praise, rewards or incentives, token economies, differential reinforcement and group contingencies.

16.1.2. Review evidence

Eleven included reviews examined reinforcement in general (in most cases this referred to a combination of praise and reward) in relation to various target behaviors. Reinforcement, used with prompting has been found effective to teach imitation to young children with disabilities, with, where reported, some evidence of maintenance and generalization (Ledford & Wolery, 2011). It has been found effective for improving communication in young children with ASD (Kim & Utley, 2009), and, used with prompting, for teaching social skills to adolescents with ASD and severe to profound intellectual disabilities (Walton & Ingersoll, 2013). Where reported, this review also found evidence of maintenance and generalization. Another review found that reinforcement was effective for teaching social skills to children and adolescents with

ASD, and meets criteria for classification as an evidence-based practice for this population (Wong et al., 2015).

Reinforcement has been used successfully to treat fears and phobias and associated challenging behavior in children and adolescents with ASD, with evidence of maintenance and generalization where reported (Lydon et al., 2015). Lydon et al. (2015) found that reinforcement can be classified as empirically supported for treatment of fears and phobias in this population (Chambless & Hollon, 1998).

Reinforcement plays an important role in a successful rapid toilet training technique for typically developing toddlers, reviewed by Warzak and colleagues (Warzak et al., 2016). On the basis of results, review authors recommended: using a wide variety of rewards, all of high importance to the child; rewarding the child immediately for sitting and immediately after voiding in the potty; providing different levels of reward for dry pants, compliance with practice sits, and voiding on the toilet, with the latter resulting in the most preferred reward.

Reinforcement has been employed effectively to address digit sucking habits in children and adolescents (Borrie, Bearn, Innes, & Iheozor-Ejiofor, 2015). It has also shown positive effects in two of three studies addressing fearful behaviors of children during dental procedures (Zhou et al., 2011). Using material rewards or verbal praise for healthy eating did not show strong effects on young children's consumption of sugar sweetened beverages (Mazarello Paes et al., 2015), but this result was based on only two studies.

In the classroom, reinforcement, along with other consequence-based interventions has been found to be more effective than antecedent interventions for reducing off-task and disruptive behavior among children and adolescents with symptoms of ADHD (Gaastra et al., 2016). Reinforcement was one of the interventions found to be effective as an individualized

PBS intervention for negative behaviors, often severe, that had not responded to 1st or 2nd tier PBS interventions among children and adolescents, with and without disabilities, in school settings (Goh & Bambara, 2012).

16.1.3. Comments

Taken together, it would seem, that reinforcement can be a helpful intervention for a wide range of target behaviors across ages among children and adolescents with and without disabilities. Reviewed evidence on specific kinds of reinforcement is summarized below.

16.2. Differential reinforcement

16.2.1. Description

Differential reinforcement is an intervention for challenging behavior in which desired behaviors are reinforced, while reinforcement for inappropriate behaviors is withheld or lessened, making the challenging behavior less reinforcing than the desired behavior. This intervention recognizes that challenging behavior had a goal, such as the reward of more attention, or escape from a disliked task. With differential reinforcement this reward is removed or lessened, e.g., through planned ignoring or escape extinction, while appropriate behavior is rewarded. The environment is thus set up so that the most efficient way for the child to get what they want is to behave appropriately, while the problem behavior becomes "irrelevant, inefficient, and ineffective" (Horner, 2000, p. 97).

There are different types of differential reinforcement (Simonsen et al., 2008; Wong et al., 2015): Differential Reinforcement of Other behavior (DRO): Reinforcement is earned for not engaging in the target behavior, i.e. for doing anything else. Differential Reinforcement of Incompatible behavior (DRI): Reinforcement is earned for engaging in a behavior that is physically impossible to do at the same time as the inappropriate behavior. Differential Reinforcement of Alternative behavior (DRA): The participant is taught an alternative or replacement behavior, that serves the same function as the inappropriate behavior. Reinforcement is earned for engaging in that specific desired behavior instead of the inappropriate behavior. Functional communication training (FCT), discussed above under communication interventions, is one type of DRA. Differential Reinforcement of Low rates of behavior DRL: Reinforcement is earned for low rates of the challenging behavior.

16.2.2. Review evidence

Eight included reviews examined differential reinforcement. Differential reinforcement (type not specified) was found effective as a classroom management intervention to increase appropriate and decrease inappropriate behavior (Simonsen et al., 2008). Differential reinforcement (DRA/I/O) was effective and found to meet criteria for classification as an evidence-based practice (WWC 5-3-20 guidelines) for increasing appropriate behavior such as social skills and communication, and decreasing challenging behavior, among children and adolescents with ASD (Wong et al., 2015). DRO and DRI were used to treat self-injury, namely skin picking and eye gouging, in children and adolescents with developmental disabilities (Lang et al., 2010). For example, with DRO, reinforcement was awarded after set time periods if there was no skin picking, while with DRI, reinforcement was awarded for keeping bandages undisturbed. Significant improvements were reported in all four reviewed studies.

DRO has been used in classroom settings to address off-task and disruptive behavior of children 6 to 11 years old, with symptoms of ADHD (Gaastra et al., 2016). Results were grouped with other consequence-based classroom interventions in the meta-analysis. Consequence-based interventions were found to reduce off-task and disruptive classroom behavior, and had stronger effects than antecedent interventions. DRO has also been used with children and adolescents with moderate to profound developmental disabilities, to address aggression, such as pinching, hitting, slapping, punching, kicking, pulling hair, biting, grabbing or throwing objects (Matson et al., 2005). Treatment was successful in significantly reducing aggression, in some cases to near zero occurrence.

DRA has been used successfully to treat food selectivity in children with ASD, to encourage appropriate mealtime behavior and eating of new foods (Reinoso, Carsone, Weldon,

Powers, & lore, 2018). DRA without extinction was reviewed across 10 studies with children and adolescents with ASD and other disabilities, to address aggression and other disruptive or challenging behaviors including self-injurious behavior and property destruction (MacNaul & Neely, 2018). Rather than putting the problem behavior on extinction, reinforcement was manipulated (by magnitude, immediacy, quality or schedule) to favour the alternative behavior over the problem behavior. The aim of this approach was to avoid problems associated with extinction, while ensuring that the alternative behavior was more rewarding for the participant. Nine out of ten studies showed positive effects, successfully reducing problem behavior and increasing the appropriate alternative behaviors. The remaining study showed mixed effects. These results suggest a promising alternative where use of extinction with DRA is not ethical or feasible, but authors caution that more research is needed as the number of included studies is relatively small. A review of 33 studies examined DRA used with children and adolescents, with and without disabilities or clinical diagnoses, in various settings for a wide range of target behaviors including aggressive, disruptive and self-injurious behaviors (Petscher, Rey, & Bailey, 2009). Various alternative behaviors were taught, appropriate communication being the most common. DRA was successful at reducing problem behaviors across the continuum from relatively minor to life-threatening. Other outcomes included enhanced quality of life for participants, better attention and reduction of teacher stress. DRA with extinction and DRA without extinction were both classified as well-established treatments for aggressive or disruptive behavior of children and adolescents with developmental disabilities. Authors note, however, that some participants failed to respond sufficiently to DRA without extinction, and that using extinction with DRA is likely to have better results. DRA with extinction was also classified as a well-established treatment for food refusal (Petscher et al., 2009).

16.2.3. Comments

Differential reinforcement is a well-tested behavioral intervention, shown to be effective across age, gender and disability status, for a wide range of target behaviors, from mild to severe. More research on use by caregivers in typical home situations would be beneficial.

16.3. Praise

16.3.1. Description

Praise is the expression of approval or admiration for appropriate behavior. With behavior specific praise (BSP), the adult gives verbal or written praise statements that explicitly describe the behavior being praised. The behavior would be something in the child's control (e.g., effort) rather than out of their control (e.g., ability).

16.3.2. Review evidence.

Seven included reviews examined verbal praise in relation to different target behaviors. Parental praise for participation in physical activity was related to increased child and adolescent activity levels (Beets, Cardinal, & Alderman, 2010). Verbal praise by parents for eating healthy food was associated with higher consumption of healthy foods (Yee et al., 2017). Effects were strongest for children 2 to 6 years old, diminishing in studies with older children. Praise was significantly associated with healthier eating, while rewards were not (Yee et al., 2017). Review authors suggest results indicate that rewarding with material rewards and praise are distinct practices with different outcomes.

Two reviews (Leijten, Gardner, Melendez-Torres, Knerr, & Overbeek, 2018; Owen, Slep, & Heyman, 2012) examined verbal praise, mostly by parents, in relation to child compliance, i.e. the degree to which children do what they are asked to do and refrain from doing what they are asked not to do. There were mixed findings in one review: Praise alone was not always enough to motivate children to comply. Reward and Time-out had more consistent effects. Where there were positive effects, praise was associated with greater compliance in non-clinical samples than with children identified as non-compliant (Owen et al., 2012). Meta-analysis by Leijten et al. (2018) of praise used with typically developing children, children with conduct problems or at

risk for development of conduct disorders, found that praise did not increase child compliance. Again, time-out showed much stronger effects. Different types of praise (e.g., labelled praise versus un-labelled praise) were not analyzed separately as there were not enough studies on each type (Leijten et al., 2018).

Teacher-delivered behavior-specific praise was examined in 2 reviews in relation to classroom behavior of children and adolescents across grades K to 12 (Royer, Lane, Dunlap, & Ennis, 2018; Simonsen et al., 2008). Contingent praise for academic behavior was associated with increases in student's correct responses, work productivity and accuracy, and academic performance. Contingent praise for appropriate social behavior was associated with increases in student's on-task behavior, attention, compliance, positive self-referent statements and cooperative play. Using contingent praise in conjunction with establishing classroom rules and ignoring inappropriate behavior was associated with increases in appropriate classroom behavior (Simonsen et al., 2008). These results should be interpreted with caution owing to the low methodological quality of this review. Meta-analysis results in the other review (Royer et al., 2018) showed increase in on-task behavior and decrease in inappropriate behaviors and tardiness, with five out of six studies showing large or very large effects. Review authors concluded that behavior-specific praise is a simple, effective strategy for increasing desired behavior and decreasing problem behaviors, classifying it as a potentially evidence-based practice, based on Council for Exceptional Children's guidelines (Cook et al., 2014).

Lastly, one review (Alber & Heward, 2000) examined praise and positive teacher attention recruited by students in relation to various target behaviors. Participants in the various studies were diverse: children and adolescents, some typically developing but most with disabilities, developmental delays, behavior problems or academic problems. Settings included

general education classrooms, a group home, and a maximum-security unit. Students were taught to evaluate the quality of their work, then politely recruit teacher praise and other positive attention such as help or feedback, then respond to teacher feedback by establishing eye contact, smiling and saying thank-you. For example, students were taught to raise hand and ask: “Does this look right?” or “How am I doing?” or after cleaning up to say: “I’m done,” and approach the teacher with outstretched arms for a hug. The theory is that when students recruit appropriately, both teacher and student receive reinforcement (Alber & Heward, 2000). In all eight included studies, staff were naive to the purpose of study, but review authors recommend that, in practice, teachers should be told that students will be recruiting praise and encouraged to respond appropriately. Recruiting increased staff praise, feedback and assistance. Production and accuracy of participant’s work increased as did task engagement. Even students with severe disabilities learned to recruit teacher praise and generalize this skill to other situations.

16.3.3. Comments

Taken together, these reviews suggest that praise is an important addition to the toolkit with positive effects on a range of behaviors. However, evidence suggests that praise will not be sufficiently effective as a stand-alone intervention for increasing compliance. Praise and reward do not always have the same effect (Owen et al., 2012; Yee et al., 2017) and it is recommended that they be treated as distinct interventions.

There is a theory discouraging the use of praise in favor of encouragement (Dinkmeyer & McKay, 1989; Nelsen, 2011). No reviewed evidence was found on encouragement, and nothing supporting the idea that praise has detrimental effects, or that encouragement would be superior.

16.4. Rewards / incentives

16.4.1. Description

A reward is something given in exchange for good behavior or work. A reward may be called an incentive when offered ahead of the desired behavior. Incentives can also refer to other motivating factors. Examples of rewards include financial incentives, vouchers, points, prizes, TV or screen time.

16.4.2. Review evidence

Sixteen included reviews examined reward in relation to various target behaviors. Two reviews examined rewards in relation to physical activity. Rewards for child physical activity assessed with pedometers, such as access to television, movies, video games, or points for use in an internet game, were associated with immediate increases in physical activity, but no studies offered data on maintenance (Lubans, Morgan, & Tudor-Locke, 2009). Meta-analysis of results in the second review (Corepal, Tully, Kee, Miller, & Hunter, 2018) showed some effects of rewards for increasing physical activity. Three reviews examined rewards for healthy eating among children. One found that all 3 studies using rewards in school settings (such as tokens exchangeable for prizes, virtual rewards or money) reported increased fruit and/or vegetable consumption, but these results did not persist after the interventions concluded (Kessler, 2016). A meta-analysis (Corepal et al., 2018) showed strong effects of incentives on healthy eating, mostly in school settings. Another (Yee et al., 2017) found no significant relationship between parental use of reward for food consumption and child healthy eating.

Parental use of food as a reward was examined (Yee et al., 2017), and found to be associated with unhealthy eating among children. Authors note, however, that the particular

foods used as rewards are often unhealthy, and assert that little is known about rewarding children with healthy foods.

Two reviews examined financial incentives in relation to adolescent smoking cessation, i.e. vouchers or monetary rewards earned for biochemically verified abstinence. One (Sigmon & Patrick, 2012) found that four of six experimental studies showed significant treatment effects. Review authors concluded that financial incentives are effective in promoting abstinence in adolescent smokers. They also note the cost-effectiveness of the intervention, considering health-care cost savings when effective. The second review (Corepal et al., 2018), found one study showing significant effects, which overlaps with Sigmon and Patrick (2012) and is already reported above. The other two studies reviewed did not find any significant effects.

A meta-analysis examining use of rewards on various adolescent health-related behaviors (Kavanagh, Oakley, Harden, Trouton, & Powell, 2011) showed that incentives can be useful in encouraging positive health behavior where a simple or single action is required, such as clinic attendance or return of vaccination consent forms. Incentives significantly increased the rate of these single-event health behaviors, but for more complex behaviors such as prevention of repeat pregnancy, TB medication adherence and orthodontic treatment compliance, no significant effects were found.

Financial incentives significantly increased the proportion of urban adolescents in full-time education at age 18, but incentives had no impact on levels of reported effort, or school attendance (Kavanagh et al., 2011). By contrast, another meta-analysis (Sutphen, Ford, & Flaherty, 2010) suggests that rewards for school attendance were effective in decreasing truancy. A third meta-analysis (See et al., 2012) examined the use of financial incentives to encourage post-16 educational participation, retention and attainment of ethnic minority students from

disadvantaged backgrounds. Results showed improved attendance and academic achievement in intervention groups.

One meta-analysis examined music activities as a reward for reading behaviors such as fluency, speed or accuracy (Standley, 2008). In both included studies, contingent music activities had significant, positive effects on reading behavior.

Star charts and other rewards have been used to address nocturnal enuresis in children and adolescents. Meta-analysis (Caldwell, Nankivell, & Sureshkumar, 2013) found that rewards were more effective than no treatment, and there were no adverse effects, but they were not as effective as enuresis alarm therapy or medication.

One review (Owen et al., 2012) examined rewards (positive non-verbal responses such as hugs, smiles and pats from parents, or tangible rewards) in relation to compliance in children, 2-9 years, with and without disabilities. In 14 of 15 studies there was an increase in compliance, regardless of the clinical status of the sample, or type of reinforcer.

Evidence suggests that children with ADHD may be more sensitive than others to rewards (Luman et al., 2005; Ma et al., 2016). Luman et al. (2005) examined rewards in relation to motivation and task performance of children and adolescents with ADHD, finding that reward had positive effects on task performance and levels of motivation for children with ADHD and non-ADHD controls. The effect on task performance was somewhat more prominent in participants with ADHD. Results indicate that children with ADHD prefer immediate over delayed rewards, and respond well to a high intensity of reinforcement. From a psychophysiological point of view, children with ADHD seemed less sensitive to reinforcement compared to controls (suggesting that they would need more reward for the same effects). Authors conclude that reward seems to be a useful method to improve task performance for

participants with ADHD. A recent meta-analysis (Ma et al., 2016) examined the interaction between reinforcement and inhibitory control in ADHD, finding that reinforcement can normalize inhibitory control in children and adolescents with ADHD to the baseline level of controls. Compared to controls, children and adolescents with ADHD showed more benefit from rewards. There were stronger effects in studies using reward without punishment (response cost). In one study, social rewards (pictures of happy faces) were more effective than monetary rewards. Authors note that other research has also shown sensitivity to social rewards in individuals with ADHD, and call for more research on this. They conclude that findings endorse the use of reinforcement as treatment for children and adolescents with ADHD.

Being given a choice enhances intrinsic motivation (see antecedent intervention: choice), however, a meta-analysis of experimental studies on the effects of choice on children and adolescents (Patall et al., 2008) showed that, in the 3 studies where unrelated rewards were given after the choice manipulation, the enhancing effect of choice on intrinsic motivation was diminished. In other studies, where participants were given a choice of reward for a task, motivation was not diminished. Authors related this to whether or not participants felt controlled by the offer of a reward.

The effects of reward on intrinsic motivation have been controversial in the study of rewards. Meta-analysis (Deci, Koestner, & Ryan, 1999) has shown that expected rewards and tangible rewards, whether engagement-contingent, completion-contingent, or performance-contingent, significantly undermine intrinsic motivation as measured by free-choice behavior. Negative effects of tangible rewards were stronger for children than for college students. The undermining effect on intrinsic motivation was observed at the time of the experiment and at assessments 1 to 2 weeks later. Unexpected tangible rewards did not affect free-choice behavior

or self-reported interest. Performance-contingent rewards did not have a negative effect on self-reported interest or enjoyment. Verbal reward (positive feedback) enhanced both free-choice behavior and self-reported interest, but was less enhancing for children than college students. Authors suggest that this may be because feedback to children was more likely to be experienced as controlling, since rewards were shown to be more undermining if administered in a controlling as opposed to an informational manner. Authors acknowledged the power of rewards to affect behavior, but stressed that they should be used with caution, especially with children, since they have been shown to undermine intrinsic motivation. Soon after this, another meta-analysis (Cameron, Banko, & Pierce, 2001) challenged Deci et al's findings using data from many of the same studies. This meta-analysis found that rewards do not necessarily have pervasive negative effects on intrinsic motivation. Rewards given for low interest tasks enhanced free-choice intrinsic motivation and did not affect task interest. Verbal rewards given for high interest tasks showed positive effects on both free-choice motivation and self-reported task interest. Effects on motivation for children were smaller than for adults, but still statistically significant. Tangible, expected (offered before the task) rewards for high interest tasks had significant negative effects on free choice motivation and task interest if offered for doing the task, and on free choice motivation if offered for doing well. However, significant positive effects were found on task interest when the rewards were offered for surpassing a certain score, and on both task interest and free choice motivation when offered for exceeding the performance level of others. Review authors conclude that rewards can be used effectively to enhance interest without undermining intrinsic motivation. They note that although both negative and positive effects were statistically significant, they were also relatively small. Results for children were not

always given separately, but age (children vs adults) was tested as a moderator and was not significant.

16.4.3. Comments

Some popular literature (e.g., Kohn, 1999), warns against the use of rewards, but it is clear from the research reviewed above and in the sections to come, that this position ignores vast quantities of research showing positive effects, particularly for children and adolescents with ADHD. Findings such as those of Deci and colleagues (1999) do suggest however that rewards should be used with caution, and attunement to the child. These findings do not suggest that the use of rewards to motivate children to do things they are not intrinsically motivated to do is at all problematic, which is good news because this is the condition under which caregivers are most likely to need this tool. Rewards only seem problematic if a child is already internally motivated to do something, in which case one would have to ask why the reward was necessary in the first place. It seems that the safest option for caregivers, is to assess, before using rewards, whether the child is motivated or not. If there is no or very low motivation to do something, then use of reward should be quite safe and probably effective. It would seem the key to good use of rewards is not to avoid using them, but to use them with attunement to the motivation levels of the child, i.e. at times when the child lacks motivation.

In line with the findings discussed in the section on praise, reward and praise were found by two further meta-analyses (Cameron et al., 2001; Deci et al., 1999) to have different effects. Both found that, in the case of high interest tasks, the use of praise was constructive, enhancing both intrinsic motivation and self-reported interest, while reward could undermine intrinsic motivation. Based on these findings it would seem logical to advise caregivers choosing between praise and reward, to assess the level of motivation a child has to do something. If intrinsic

motivation to do the task is low, reward is likely to work better than praise to achieve compliance (Owen et al., 2012). If motivation is high, however, it would be safer to use praise.

The review on nocturnal enuresis (Caldwell et al., 2013) shows a further limitation of reward – the child needs to be physically and developmentally able to perform the desired behavior. The fact that medication or enuresis alarms were often more effective suggests that rewards may not have worked because the child needed extra support, beyond rewards, to accomplish the desired behavior. Similarly, in the review addressing toilet training (Warzak et al., 2016), in one study, 9 out of 10 children who did not complete training were under 25 months. Authors note the possibility that they were not developmentally ready for toilet training.

A further caution raised in the reviewed research is the use of food as a reward, specifically unhealthy food, which has been shown to have negative effects (Yee et al., 2017). There does not seem to be any reviewed data on the use of healthy food as reward.

There is limited data on the long term effects of reward, however, even if they were found not to have long term effects, they could still be a useful addition to the toolkit for their short-term effects, such as compliance, or motivating children to try new foods or activities.

An important consideration for caregivers and teachers using reward is whether the reward is motivating enough for the child to have the desired effect on behavior. This may have been the reason for the lack of results in the smoke free class competition, a group contingency discussed below, i.e. that the rewards offered for abstinence were possibly less rewarding than the target behavior (smoking).

16.5. Token economy

16.5.1. Description

Token economy is a reward system in which participants earn tokens or points for desired behavior, that can later be exchanged for back-up reinforcers such as activities or tangible goods. This is different from token reinforcement, in which participants receive specific backup reinforcers for earning a set number of tokens. In a token economy, participants must make a monetary decision when exchanging tokens for backup reinforcers, while with token reinforcement, tokens simply show progress towards a goal (Maggin, Chafouleas, Goddard, & Johnson, 2011). Some token economies include response cost, which involves a loss of tokens for inappropriate behaviors. Response cost is discussed separately under cost.

16.5.2. Review evidence

Five included reviews examined token economy, three in classroom settings (Maggin et al., 2011; Simonsen et al., 2008; Soares, Harrison, Vannest, & McClelland, 2016), one in rehabilitation settings for acquired brain injury (Tatla, Sauve, Jarus, Virji-Babul, & Holsti, 2014), and one with juvenile inmates in prisons and other institutions (Gendreau, Listwan, Kuhns, & Exum, 2014). All three school-related reviews found token economies successful for improving behavior in classroom settings, with the most recent (Soares et al., 2016) finding sufficient evidence for preliminary classification of the token economy as evidence-based practice for classroom implementation. Results across reviews included increased student attention, decreased inappropriate or disruptive behavior, increased assignment completion and student preparation for class. Moderator analyses (Soares et al., 2016) showed that the intervention was slightly more effective for children aged 6 -15, than for those aged 3 - 5. No difference in

effectiveness was found between general and special education settings, or with the inclusion of response cost or verbal cuing.

Token economies were examined as a motivational intervention for children and adolescents with moderate to severe acquired brain injury (Tatla et al., 2014). After brain injury, intensive practice (thousands of repetitions) of certain behaviors, is required to facilitate recovery. Lack of motivation is thus a significant limiting factor in recovery. Five RCTs and one SCD were reviewed. The RCTs showed that token economies significantly improved memory and response inhibition performance in children with ABI. In the single case research design study, use of a token economy improved therapy attendance rates for the two participants. Effects varied based on the severity of brain injury, with more severely injured participants showing less improvement with reward. This is in keeping with the finding that more severe injuries are likely to affect particular white matter structures known to be important in reward processing.

Target behaviors in the review of token economies used with juvenile inmates of prisons and other institutions (Gendreau et al., 2014) included aggression, anti-social attitudes, fighting, stealing, educational performance, work, hygiene and self-esteem. Meta-analysis showed significant improvements in behavioral, educational and work-related outcomes. Based on the evidence, review authors made the following recommendations: For token economies, criteria should be explicit and consistently applied. Participant's preferences should be considered when deciding on reinforcers, to make sure the system is motivating. Level systems are recommended and steps between levels should be demanding of participants. Participants should not be allowed to hoard tokens or go into debt. If response cost is used, it should not be a first option and should involve choice on the part of the inmate, such as choosing whether to attend a class or pay in

some tokens to excuse themselves. Interventions should be implemented in the context of a positive relationship between inmates and staff.

16.5.3. Comments

The above evidence suggests that token economies are a useful and effective intervention for a range of behaviors. This intervention could also be used at home, for example, children could be awarded tokens for desired behaviors which they could later exchange for a proportionate amount of screen time. No reviews were found, however, examining token economies used by caregivers at home, an obvious gap in the literature.

16.6. Group contingencies

16.6.1. Description

Group contingencies are reward systems in which common expectations are set for a class or group, and common positive outcomes earned. There are different types of group contingency: dependent, independent and interdependent. In a dependent group contingency, rewards for the entire group depend on the performance of a selected member or members of the group, while the performance of the rest of the group members is irrelevant to the reward. In an independent group contingency, each group member receives reward based on their own performance, but everyone in the group has the same target behaviors, contingencies and rewards. In an interdependent group contingency, the entire group receives reward, based on the behavior of any or all of the members. The Good Behavior Game (reviewed separately below) is an example of an interdependent group contingency.

16.6.2. Review evidence.

Five reviews examining group contingencies were included. The first examined interdependent group contingencies as a means to prevent smoking initiation (Johnston, Liberato, & Thomas, 2012). Six out of the seven included studies were trials of the Smoke-free Class Competition (SFC), widely implemented in Europe, in which classes commit to being smoke free for 6 months, reporting regularly on their smoking status. If, at the end of 6 months, 90% or more of the class is non-smoking, the class qualifies for the prize draw or lottery, in which they can win prizes for the whole class, such as special activities, class trips or monetary prizes. The remaining study was a controlled trial of a competition in which students in the school with the lower smoking rates at the end of the project (1 year) received rewards such as movie passes, ice-cream vouchers or T-shirts with the project logo. Meta-analysis did not find any significant

effects of these interventions on smoking initiation. No adverse effects, such as false claims about smoking status or bullying of smoking students, were found either. By contrast, it is interesting to note good quality evidence showing that the Good Behavior Game (discussed below), also a group contingency but not tobacco-specific, does have significant effects on tobacco use (MacArthur et al., 2018).

The remaining four reviews examined group contingencies used in K–12 classroom or school settings to decrease disruptive behavior and increase appropriate behavior (Little, Akin-Little, & O'Neill, 2015; Maggin, Johnson, Chafouleas, Ruberto, & Berggren, 2012; Maggin, Pustejovsky, & Johnson, 2017; Simonsen et al., 2008). Examples of target behaviors included disruptive behavior, rule violation, stealing, aggression, swearing, academic performance, on-task behavior, prosocial behavior and homework. Most of the studies included in these reviews employed the interdependent group contingency, but the other two types were also used. All reviews reported positive results, and all varieties of group contingency were effective with a wide range of target behaviors. Effects were strong and social validity, where reported, good (Little et al., 2015). Age, gender and grade level did not significantly moderate results (Maggin et al., 2017). Application of the WWC criteria shows that group contingencies can be considered an evidence-based intervention for students with challenging behavior in school settings. If the different types of group contingency were not grouped together, the interdependent group contingency would be supported by the most evidence and qualify as evidence-based (Maggin et al., 2012).

16.6.3. Comments

Aside from the smoke free class competition, which does not seem very rewarding for students, and has not demonstrated evidence of success, reviewed evidence shows that group

contingencies can be a strongly effective classroom intervention across age, grade, gender, disability status and target behaviors. Group contingencies could also be used at home. An interdependent group contingency could be employed, for example, in which each sibling's behavior earns points toward a shared reward, such as a mutually desired outing. However, no reviews were found of group contingencies used by caregivers at home.

16.7. Good Behavior Game

16.7.1. Description

The Good Behavior Game (GBG) is an interdependent group contingency first used in the 1960's to address disruptive classroom behavior (Barrish, Saunders, & Wolf, 1969). In the original version, the class was divided into teams, and points allocated for problem behaviors. The team with the lowest number of points was rewarded, usually daily. In other versions, more than one team can qualify for reward by scoring below a certain number of points, other behavioral interventions or a self-monitoring component may be added, or points may be allocated for positive behavior, rather than negative (Bowman-Perrott, Burke, Zaini, Zhang, & Vannest, 2016).

16.7.2. Review evidence

Eight included reviews examined the GBG in relation to various target behaviors. Two reviews were meta-analyses of SCD studies employing GBG to decrease disruptive, aggressive or off-task classroom behaviors, and increase attentive or on-task behaviors (Bowman-Perrott et al., 2016; Flower, McKenna, Bunuan, Muething, & Vega, 2014).

One Meta-analysis showed that the GBG in both its original and modified formats was effective, substantially reducing problem behavior, especially off-task and disruptive behavior and increasing prosocial behavior. Moderator analysis results suggest that students with or at risk for EBD benefit most from the intervention (Bowman-Perrott et al., 2016). Authors concluded that the GBG is an effective and positive intervention, easy to use in school settings. They add that the fact that there was no significant difference in outcomes between original and modified formats of the game, offers teachers flexibility to tailor it to the specific needs of their students

e.g., awarding points for appropriate behaviors, using more than 2 teams, using the GBG in different settings, or including additional behavioral interventions.

Results of the other meta-analysis (Flower et al., 2014) also showed immediate moderate to large effects on challenging behaviors across grades (K-12). GBG had modest effects on peer acceptance or rejection in the two studies addressing this topic. As children behaved better, their peers liked them more, suggesting that effective classroom discipline could have important social consequences for children. Rewards played an important role in intervention effectiveness. Studies with modest or no effects tended not to use rewards or to use them in a limited way, suggesting that rewards are a critical component of the GBG. Review authors concluded that the GBG is a promising intervention that can be easily used by staff in a variety of school settings, without extensive training (Flower et al., 2014).

A further 6 reviews cover evidence from RCTs and 1 non-randomized controlled trial in different countries (e.g., USA, Netherlands, Spain). Where reported, the intervention class played GBG several times a week over a period of one or two years starting in Grade 1. Follow-up intervals varied, ranging from 1 to 12 years. Results were impressive: At 1 and 2-year follow-up, GBG groups showed less aggression, improved attention and concentration, less oppositional behavior and conduct problems. One review examined a number of different programs, rating GBG as the intervention with the best balance of evidence for school aged children for prevention of aggressive, disruptive or oppositional behavior (Bayer et al., 2009). A meta-analysis showed significant long-term effects on alcohol misuse with participants, particularly males, being less likely to have lifetime alcohol abuse or dependence disorders. GBG was one of only 3 interventions (the other two are multi-component programs) that demonstrated significant effects on alcohol misuse. Authors concluded that evidence supports this intervention over

alcohol-specific interventions (Foxcroft & Tsertsvadze, 2011). A recent meta-analysis showed significant effects of GBG on multiple risk behaviors: At 6 or 12 year follow-up (depending on the study), results showed less alcohol abuse and dependence, less tobacco use, less drug use, lower rates of anti-social personality disorder, less depression, especially for males, and higher high school graduation rates, especially for males (MacArthur et al., 2018). GBG showed preventative effects on externalizing behavior after 6 to 12 months, and a lower incidence of psychiatric diagnosis after 5 years. Effect sizes were small, which is normal when looking at prevention rather than treatment (Smedler, Hjern, Wiklund, Anttila, & Pettersson, 2015). GBG also showed significant effects for prevention of oppositional defiant disorder (ODD) and conduct disorder. At follow-up, there were significantly fewer behavioral diagnoses (e.g., childhood conduct disorder; adult anti-social personality disorder) among children who had played the GBG. Although not relevant to their review question, authors noted that the GBG has also been found to reduce the likelihood of suicidal ideation (Waddell, Schwartz, Andres, Barican, & Yung, 2018). A further meta-analysis found a decrease in aggression, but mixed results on the impact of the GBG on hyperactivity and shyness. One study found a significant decrease in below-average attainment, but authors caution that few reliable conclusions can be drawn from the results of the two studies included, one of which was not randomized (Whear et al., 2013).

16.7.3. Comments

The GBG seems to be one of the few interventions where long term results have been rigorously evaluated. The impressive effects found have prompted the suggestion that it be used widely in schools as a “behavioral vaccine” against substance abuse, conduct problems and other behavior disorders (Embry, 2002). The above reviews each included GBG as one of the

interventions evaluated for their focus topic, e.g., prevention of externalizing behaviors, behavior disorders or alcohol misuse. Each included between 2 and 5 trials on GBG, and usually only reported GBG outcomes on the topic of their review. A review of RCTs dedicated to GBG and looking at all the outcomes that have been found would be a useful addition to the literature on what is clearly a highly effective intervention with far-reaching positive outcomes.

17. Reprimands

17.1. Description

Reprimands refer to an expression of disapproval, or telling a child what they did wrong (Leijten et al., 2018). Error correction is a specific kind of reprimand involving a brief statement, contingent and specific, made by an adult. When the child engages in an inappropriate behavior (contingent), the adult states the observed behavior, and tells the child exactly what they should do in the future (specific) (Simonsen et al., 2008).

17.2. Review evidence

Two reviews examined the effects of reprimands. One focused on use of error correction by teachers in school settings (Simonsen et al., 2008), and one on use of reprimands by parents (Leijten et al., 2018). Simonsen et al (2008) reviewed 4 studies on error correction. Results showed a decrease in reprimanded behavior. Corrections that were loud in tone were less effective than quiet / discreet corrections. Brief corrections (1 to 2 words) were more effective than longer ones (2 or more phrases), and corrections delivered consistently were more effective than those delivered inconsistently.

Leijten et al. (2018) examined reprimands by parents, in relation to compliance for children age 1 to 12, some typically developing, some with conduct problems or at risk for developing conduct disorders. Reprimands referred to the parent telling the child what they did wrong. Meta-analysis showed that verbal reprimands did not consistently increase child compliance. Increase in compliance showed when observed and parent-reported outcomes were combined, but not when analyzed separately. Time-out had a much stronger effect on compliance.

17.3. Comments

There is too little reviewed evidence to draw firm conclusions about reprimands. The little evidence available would suggest that error correction, a brief statement describing the observed misbehavior and instruction about what to do in future, is more effective than just telling a child what they did wrong. It would also seem that a raised voice or long lecture about the wrongdoing would diminish effectiveness. More research is needed, however, to confirm these points and give further guidance on the use of reprimands.

18. Restorative Justice Conferencing (RJCs)

18.1. Description

Restorative justice theory takes the position that all crime or wrongdoing happens in the context of relationship and thus incurs responsibility of reparation to the victims. The perpetrator of the crime is held accountable and must act to repair the damage done by their actions. Justice is thus defined as an attempt to repair the harm a crime has caused, rather than inflicting harm on the offender (Strang, Sherman, Mayo-Wilson, Woods, & Ariel, 2013). There are different types of RJ interventions, all of which aim to facilitate restitution and reconciliation, such as victim-offender mediation (VOM), the family group conference (FGC), or peace-making circles, characterized by a talking piece. For VOM, a mediator meets with the victim and the offender separately, to prepare them for the meeting with each other. This is followed by a mediated session together, in which victim and offender speak about the crime and its effects, and then decide together on how best to repair the damage (Nugent, Williams, & Umbreit, 2004). FGCs involve a meeting between the victim, offender, family members of both and a conference facilitator, to discuss the crime and its effects, and to decide together on appropriate reparation.

18.2. Review evidence

Six included meta-analyses examined restorative justice interventions. No reviews were found examining peace-making circles. One review mentioned the intervention, but found no studies meeting inclusion criteria (Wong, Bouchard, Gravel, Bouchard, & Morselli, 2016).

Nugent, Williams and Umbreit (2004) reviewed intervention studies of VOM, with non-VOM comparison groups in relation to criminal recidivism among juvenile offenders who had committed violent or property crimes. Group formation method and definition of re-offense moderated study outcomes, however, based on the best available group formation methods, there

was evidence that VOM is associated with a lower likelihood of re-offense. Authors concluded that juveniles who participated in VOM may be as much as 30% less likely to reoffend as nonparticipants, while participation in VOM was not associated with any increase in offenses (Nugent et al., 2004). More recent and higher quality reviews, however, have not found effects of this strength.

de Vries, Hoeve, Assink, Stams and Asscher (2015) reviewed RCTs and quasi-experimental studies of prevention programs for juveniles at risk for persistent offending or more severe antisocial and delinquent behavior. The aim of the meta-analysis was to identify effective ingredients of these interventions for prevention of delinquency, criminal offending, or recidivism. There were various interventions, including restorative justice interventions such as FGC and VOM. Effects were small but significant, showing that programs containing behavioral modelling, behavior contracting, or parent training in behavioral skills (e.g., contingency management) yielded the strongest prevention effects. Age, gender and ethnicity did not moderate results. Aside from the comparative result, that other intervention components were more effective, no outcomes were reported for restorative justice interventions (de Vries, Hoeve, Assink, Stams, & Asscher, 2015).

Livingstone, Macdonald and Carr (2013) reviewed RCTs of Restorative Justice Conferencing (RJC) for juvenile offenders who had committed violent or property crimes, in relation to criminal recidivism. All RJCs involved a meeting between the victim, offender, supporters of both and a conference facilitator, to discuss the crime and its effects, and decide together on appropriate reparation. Average duration varied between 34 and 85 min. In all cases RJC was used as a diversion intervention. Participants were analyzed based on assigned treatment, rather than treatment delivered. Meta-analysis failed to find a significant effect for

RJC over normal court procedures for rate of re-offending; offender remorse, recognition of wrong-doing, self -esteem; or victim satisfaction. However, sensitivity analysis results suggest RJCs were possibly associated with greater victim satisfaction and slightly higher recognition of wrongdoing by offenders. Authors noted that results should be interpreted with caution owing to the small number of studies and lack of high-quality studies (Livingstone, Macdonald, & Carr, 2013).

Schwalbe, Gearing, MacKenzie, Brewer and Ibrahim (2012) reviewed RCTs and quasi-experimental studies of restorative justice diversion programs such as FGC and VOM in relation to criminal recidivism among juvenile offenders of various ethnicities, at the pre-adjudication stage of justice processing. Overall, the effect of diversion programs on recidivism was non-significant. Effect sizes were moderated by level of researcher involvement. When researchers were directly involved, e.g., in monitoring intervention fidelity, statistically significant decreases in recidivism were observed (Schwalbe, Gearing, MacKenzie, Brewer, & Ibrahim, 2012).

Wong, Bouchard, Gravel, Bouchard and Morselli (2016) reviewed RCTs and quasi-experimental studies of restorative justice diversion programs in relation to criminal recidivism for juvenile offenders of various ethnicities. Restorative interventions such as FGC and VOM were used. Meta-analysis results showed that, overall, Restorative Justice programs were effective at reducing juvenile recidivism. Quality of the studies was, however, relatively weak, and study quality moderated results in that studies with more rigorous designs tended not to show significant effects on recidivism. Authors called for more and better-quality research (Wong et al., 2016).

It is possible that the lack of significant effects found in the reviews above is less an indication that restorative justice interventions are ineffective, and more an indication that

criminal recidivism is not a very sensitive measure. Strang and colleagues (2013) reviewed three RCTs of restorative justice conferencing for juvenile offenders in relation to criminal recidivism and victim satisfaction. This review used cost of crime data, which proved a more sensitive measure than recidivism alone. In addition, crimes were weighted by seriousness and frequency, also more sensitive measures. Meta-analysis results show that RJCs were associated with a small, but significantly cost-effective reduction in recidivism, and suggested that repeat offenders were likely to hurt their victims less. Victim satisfaction was consistently higher, with narrative results showing that victims were more likely to receive an apology they considered sincere, and less likely to desire revenge against the perpetrator if they participated in an RJC (Strang, Sherman, Mayo-Wilson, Woods & Ariel (2013).

18.3. Comments

The above reviews suggest that restorative justice interventions have some worthwhile effects, but also some important limitations. One obvious limitation is that consent of both victim and perpetrator is needed to engage in RJCs, and many perpetrators and victims may be unwilling. The effects found, although important, also seem limited, and so it would seem wise, in addition, to include behavioral interventions that have been found effective with this population, rather than to use restorative justice interventions as stand-alone interventions. It should be noted that no review suggested that restorative justice interventions were less effective than traditional court processing and sentencing.

An obvious gap in the literature concerns the use of restorative justice interventions in cases less extreme than criminal offending. It is possible that stronger effects would be found in less hardened populations. Restorative justice interventions are used in schools (González, 2015),

and by caregivers at home (Wachtel & McCold, 2001). A systematic review of effects of such interventions would be a useful addition to the literature.

19. Restraint

19.1. Description

Restraint interventions are controversial and there is a trend towards reducing their use, but under certain circumstances they may still be appropriate (Heyvaert, Saenen, Maes, & Onghena, 2014). Restraint interventions are often used for self-injurious and sometimes for aggressive behavior. Various interventions fall into this category. Examples are: response blocking, in which the child is physically prevented from carrying out an inappropriate behavior such as aggression or self-injurious behavior (SIB), e.g., by catching an arm raised to punch someone; environmental restraint, e.g., time-out; manual restraint (for SIB), such as holding the child's hands down for a short while contingent on each instance of SIB; and mechanical restraint, such as protective clothing or equipment for SIB (Heyvaert et al., 2014).

19.2. Review evidence

Three reviews examined restraint interventions. Mechanical restraint in the form of an orthodontic appliance (palatal crib or palatal arch) was examined as an intervention for children with a digit-sucking habit (Borrie et al., 2015). The appliance was fitted in the child's mouth, to interfere with the habit of digit sucking, and was not removable by the child. The intervention was effective, significantly increasing the number of children who stopped digit sucking in both the short and long term, in comparison to no treatment. Beneficial effects were also found for participants' teeth. Studies were RCTs or quasi-randomized controlled trials.

Mechanical restraint in the form of protective clothing or equipment was examined as an intervention for skin picking or eye gouging among adolescents with developmental disabilities (Lang et al., 2010). The clothing items physically prevented participants from engaging in the SIB, and were used either contingently (worn briefly following the target behavior) or

continuously (worn at all times). Examples included bandages covering areas commonly picked, padded helmet and foam gloves worn continuously or for 2 min contingent on eye gouging; soft cotton gloves worn contingent upon skin-picking. Authors noted the trend over time within reviewed studies towards the use of less restrictive procedures. Studies using aversive procedures (not relevant to this overview) were all published before 1982. Restrictive clothing and equipment have been used recently, but use has changed from continuous to contingent (worn briefly following SIB). Results showed that protective clothing or equipment was effective, significantly decreasing eye gouging, skin picking and number of open sores. All 3 studies (SCDs) showed maintenance of effects at checks from 3 to 6 months after the intervention. Two studies, described as "well designed", compared continuous to contingent protective equipment and found that contingent use may be more effective and easier to fade (Lang et al., 2010).

Heyvaert et al. (2014) examined restraint interventions for aggressive or self-injurious behavior (SIB) in children and adolescents with moderate, severe or profound intellectual disability. Various kinds were used: response blocking (for aggression or SIB); environmental restraint (time-out for aggressive, destructive or socially disruptive behavior); manual restraint (for SIB); mechanical restraint (protective clothing or equipment for SIB such as helmets, protective arm restraints, wrist weights, face mask or body padding). Results showed that restraint interventions were on average highly effective, significantly reducing challenging behavior. Authors caution that distinction should be made between management and treatment of challenging behavior. This outcome would be classified as treatment, but the primary aim of using restraint is to prevent people from harming themselves or others, which is management, not treatment (Heyvaert et al., 2014).

19.3. Comments

Restraint is one of the interventions that most keenly demonstrates the need for attunement in discipline Using restraint when it is not needed could be a human rights violation, but not using it when it is called for, could also be unethical this allows harm to self or others. The research reviewed here shows that the use of restraint can be important in the management and treatment of self-injurious behavior. The only restraint interventions mentioned for aggression were response blocking, and environmental restraint in the form of a time-out. Time-out is discussed in a separate section. Restraint remains a controversial intervention and should be used with minimum force (e.g., contingent instead of continuous use if possible) and the utmost care.

20. Self-management

20.1. Description

Sometimes called self-regulation, self-management interventions involve self-monitoring and usually self-recording of a specific target behavior (e.g., on-task behavior or a specific disruptive behavior) and may involve other components such as goal-setting, self-evaluation and self or adult-delivered reinforcement. The self-monitoring component usually forms the basis of self-management / self-regulation interventions (Busacca, Anderson, & Moore, 2015).

20.2. Review evidence

Sixteen reviews examining self-management interventions were included (Briesch & Chafouleas, 2009; Briesch, Daniels, & Beneville, 2018; Bruhn, McDaniel, & Kreigh, 2015; Busacca et al., 2015; Carr, 2016; Carr, Moore, & Anderson, 2014; Darling & Sato, 2017; Davis, Mason, Davis, Mason, & Crutchfield, 2016; Gaastra et al., 2016; Goh & Bambara, 2012; Hynynen et al., 2016; Lubans et al., 2009; Mooney, Ryan, Uhing, Reid, & Epstein, 2005; Reid, Trout, & Schartz, 2005; Richardson et al., 2015; Southall & Gast, 2011). Five of these gave the focus intervention the term self-monitoring, which either referred to the specific self-management components of self-observation and self-recording (Bruhn et al., 2015; Darling & Sato, 2017; Hynynen et al., 2016; Lubans et al., 2009), or referred to the broader category in the same way as the term self-management, including multiple components (Davis et al., 2016). In reviews addressing ADHD (Gaastra et al., 2016; Reid et al., 2005; Richardson et al., 2015), the term self-regulation was used, rather than self-management, but seemed to refer to the same components as the term self-management in the other reviews.

In terms of target population, this intervention has been used across all school grades for children with and without disabilities, including emotional and behavioral disorders. Four

reviews focused specifically on children and adolescents with ASD (Carr, 2016; Carr et al., 2014; Davis et al., 2016; Southall & Gast, 2011); three focused on children and adolescents with ADHD (Gaastra et al., 2016; Reid et al., 2005; Richardson et al., 2015).

Typical target behaviors were various on-task or disruptive classroom behaviors. In addition, target behaviors specific to ADHD were inattention, hyperactivity, impulsivity and poor scholastic performance (Richardson et al., 2015), while reviews addressing ASD also targeted social skills and daily living or other skills (Carr, 2016; Carr et al., 2014; Davis et al., 2016; Southall & Gast, 2011). Three reviews addressed health related behaviors such as physical activity (Darling & Sato, 2017; Hynynen et al., 2016; Lubans et al., 2009) or dietary behaviors (Darling & Sato, 2017).

All 16 reviews reported positive results. Maintenance of results has been shown (Mooney et al., 2005), although one review found that results were generally short term for physical activity (Hynynen et al., 2016). Most reviews showed moderate to strong effects, while the three public health reviews reported relatively small but significant improvements in physical activity, dietary behaviors and weight loss. This seeming difference in strength of effect may be due to the fact that most of the behavioral reviews were based on SCD studies, while the public health reviews examined RCTs and other experimental studies with group designs.

Reviews addressing on-task or disruptive classroom behaviors showed that self-management interventions were effective across behaviors, disability categories, and age or grade (Busacca et al., 2015; Carr et al., 2014; Southall & Gast, 2011), and had stronger effects than antecedent interventions for children and adolescents with symptoms of ADHD (Gaastra et al., 2016). Effects were large for children and adolescents with ADHD, including effects for children on medication (Reid et al., 2005). It has been noted that self-regulation interventions

may be are particularly appropriate for children with ADHD, since self-regulation is a deficit of this condition (Reid et al., 2005). Social validity, where recorded, was neutral to positive (Richardson et al., 2015; Southall & Gast, 2011). Self-management interventions have been formally classified as evidence-based practice for primary school students with behavior problems in regular classrooms (Busacca et al., 2015), for reducing challenging behavior for children 4 to 18 years with ASD (Carr, 2016), and for increasing social and academic skills for students with ASD, of all ages and levels of ability (Carr et al., 2014).

20.3. Comments

Self-management is a well-tested intervention with robust evidence of effectiveness across a wide range of ages, disabilities and target behaviors.

21. Structure

21.1. Structure: general

21.1.1. Description

Structure refers to explicitly defined rules, limits, instructions, routines and other adult-directed activities. Although structure is a component in many interventions and integral to concepts like school climate, it was only possible in this overview, to include reviews that gave specific information on structure. This section discusses structure in general, while the sections that follow review specific aspects of structure for which evidence could be found, such as rules and activity schedules.

21.1.2. Review evidence

Karreman et al. (2006) examined structure (their term was parental positive control) in relation to self-regulation in preschool children. Self-regulation included inhibition or self-control and emotion regulation. Structure, or positive control, included parental behaviors like limit-setting, directiveness with mild to moderate power assertion and the use of clear guidance and instructions. Positive control by parents was positively associated with children's self-regulated behavior, while negative control, such as coercive behaviors, critical comments or hostility, was negatively associated with self-regulated behavior. The direction of the associations could not be determined since included studies were cross-sectional not longitudinal (Karreman, van Tuijl, van Aken, & Deković, 2006).

Simonsen and colleagues (2008) examined classroom structure other than rules, defining structure as explicitly defined routines and teacher or adult-directed activity. Classrooms with more structure were associated with more appropriate academic and social behaviors. Students showed greater task involvement, friendlier peer interactions, more helpful behaviors (e.g.,

cleaning up), more attentive behavior, and less aggression. In addition to positive results, one of the three studies relevant to structure also found that students in high-structure classes engaged in less pro-social behavior toward peers, and that high structure was unrelated to independent task persistence. Review authors concluded that this may indicate a need for balance between teacher-directed structure and student independence (Simonsen et al., 2008). These results should be interpreted with caution however, due to the small number of included studies and low quality-rating of this review.

21.1.3. Comments

The limited review evidence available suggests that structure is important for children, and possibly plays a role in scaffolding (Berk & Winsler, 1995; Vygotsky, 1978) their development of self-regulation. More research on structure specifically would be needed in order to confirm this. The review on classroom structure suggests the need for attunement to how much scaffolding children need in terms of structure. Structure seems to help children to behave better, but too much structure may infringe on areas in which they are ready to be more independent. Again, however, more research is needed to draw any firm conclusions.

Specific aspects of structure, such as rules, for which review evidence was found are discussed under separate headings below. Gaps in reviewed research on structure include use of structure, other than rules, in the home and classroom, e.g., addressing negative behaviors such as nagging, conflict or procrastination with schedules (e.g., showing when TV watching is allowed); turn taking, rations, wish lists or deadlines. For example, a common use of structure by parents is that of counting to give a deadline: “I’m counting to 3…” This could be combined with other interventions such as qualifying for a reward if the deadline is met, but there were no

reviews found which addressed this. There is a need for more research on use of routines, and no reviews were found meeting inclusion criteria on the effects of family rituals.

21.2. Structure: Policies

21.2.1. Description

Policies are principles and guidelines adopted by organizations or groups which aim to affect behavior in various ways. For example, school policies may increase availability of healthy food and mandate or create opportunities for physical activity. They may ban unhealthy products such as SSBs, or behaviors such as bullying, smoking or alcohol use. They may limit opportunities for students to engage in unhealthy behaviors (e.g., by not allowing them to leave the school premises), or deter them by having clear consequences or penalties for rule violations.

21.2.2. Review evidence

Thirteen reviews examined the effects of school policies in relation to various target behaviors. School policies were examined in relation to bullying and harassment of LGBT students in secondary schools, such as victimization; antigay language; teasing; physical or relational aggression and name-calling. Students from schools with policies that included sexual orientation or gender identity reported fewer problems with all aspects of school safety. A more supportive environment (which includes anti-bullying and anti-discrimination policies) was also significantly associated with fewer suicide attempts (Black, Fedewa, & Gonzalez, 2012). A meta-analysis (Farrington & Ttofi, 2009) showed school policies to be an important element associated with a decrease in bullying for 6 to 14-year-olds, but effects were not significant for victimization (being bullied) (Farrington & Ttofi, 2009).

School policies have also been shown to play an important role in increasing physical activity (Morton, Atkin, Corder, Suhrcke, & Sluijs, 2016; Robertson-Wilson, Dargavel, Bryden, & Giles-Corti, 2012), reduction in consumption of sugar sweetened beverages (SSBs) in young children (Mazarello Paes et al., 2015) and adolescents (Vézina-Im et al., 2017), and improved

food-consumption behaviors for children and adolescents age 5 – 18, such as selection, intake, and sales of healthy foods, and decreased plate waste (Mansfield & Savaiano, 2017).

Four reviews showed that school policies were associated with a reduction in adolescent smoking (Aveyard, Markham, & Cheng, 2004; Galanti, Coppo, Jonsson, Bremberg, & Faggiano, 2014; Schreuders, Nuyts, van den Putte, & Kunst, 2017; Sellström & Bremberg, 2006). A fifth examined population-based policies in relation to adolescent smoking (Wilson et al., 2012), finding that policies banning smoking in public places were associated with lower smoking prevalence among adolescents. Banning advertising and sponsorship of tobacco products was also associated with reduction in adolescent smoking.

A review looking at four behavioral risk factors for noncommunicable diseases: unhealthy diet, physical inactivity, tobacco use and alcohol abuse among children and adolescents aged 6 to 17 showed mixed results: Overall, school policies had positive effects on behavioral outcomes and biomarkers. They were more effective in reducing unhealthy diet (e.g., restriction of sugar-sweetened beverages), tobacco use, physical inactivity and inflammatory biomarkers, than for overweight / obesity, anthropometric measures or alcohol use (Singh et al., 2017). Another review found that, to prevent and treat overweight and obesity among children aged 4 to 11, results did not show significant effects of school diet and physical activity related policies implemented alone. When policies were developed and implemented as part of wider intervention programs, however, significant reductions were found in body mass index scores. (Williams et al., 2013).

21.2.3. Comments

Taken together, it seems school policies are an important element in reducing detrimental behaviors and increasing healthy behaviors. Population level policies can also make a difference.

21.3. Structure: Rules

21.3.1. Description

Rules are regulations defining acceptable or unacceptable behavior in an environment e.g., parental or school rules restricting media, unhealthy food, tobacco; cannabis & alcohol, or insisting on appropriate dinner table or classroom behavior.

21.3.2. Review evidence

10 reviews examined parental or home rules in relation to various target behaviors. Parental rules limiting their child's media time (TV, video games, and/or internet) or content allowed, showed a small, but statistically significant role in preventing negative child or adolescent outcomes such as excessive media time, aggression, substance use and sexual behavior. Protective effects were strongest for media time and sexual behavior (Collier et al., 2016). There is also a small amount of evidence that parental rules restricting TV viewing time are associated with decreased sedentary behavior in young children (2 – 7 years) (Mitchell, 2012).

Parental restrictive guidance concerning consumption of sugar sweetened beverages among young children (age 2 -6) showed equivocal results (Mazarello Paes et al., 2015). Parental rules regarding fruit and vegetable consumption (demanding / allow) were positively associated with children's fruit and / or and vegetable consumption, but were unrelated for 3 out of 4 adolescent samples (Pearson et al., 2009). Rules (restrictive guidance) were negatively associated with unhealthy food consumption. This effect was more powerful among children older than 6. It's association with healthy food consumption was mixed for younger children, but did not seem to affect healthy food consumption for children older than 12 (Yee et al., 2017).

Home smoking restrictions were associated with reduced adolescent smoking behaviors. A completely smoke-free home was associated with better results than partial restrictions (for example, allowing smoking in designated areas, only by guests, or on certain special occasions), and seemed to have a stronger influence on earlier rather than later stages of the smoking uptake continuum (Emory, Saquib, Gilpin, & Pierce, 2010). Parenting programs encouraging rule setting and advising parents to set strict rules against underage substance use showed some positive effects in preventing, curbing or reducing adolescent substance use (Kuntsche & Kuntsche, 2016).

Strict rules and parental disapproval of alcohol use were shown to be important protective factors in the prevention of adolescent alcohol use, drunkenness and alcohol-related problems. Strict rules were also found to enhance adolescent self-control. Some parents allowed their adolescents to drink in order to encourage responsibility, prevent social harm to their child, or because they experienced peer pressure from other parents who allowed their teens to drink. However, more liberal parental attitudes toward alcohol use were associated with an increased likelihood of alcohol abuse and binge drinking. (Mynttinen et al., 2017). In another review, parental rules about alcohol did not show an association with alcohol initiation or later alcohol consumption. While there was no clear evidence that parental disapproval of adolescent drinking was associated with delayed alcohol initiation, it was associated with lower levels of later alcohol use (Ryan et al., 2010). Sharmin and colleagues (2017a) meta-analysis results suggest that when parents set rules concerning alcohol, their children are less likely to become risky drinkers. Parental alcohol rules were significantly negatively associated with adolescent risky drinking, while parental approval of alcohol use was positively associated with risky drinking (Sharmin et al., 2017a).

Five reviews examined classroom or school rules. The first (Alter & Haydon, 2017) compared the empirical research on classroom rules with 7 rule characteristics commonly recommended in textbooks and other teacher-oriented literature, i.e. that rules should be: 1) small in number; 2) created collaboratively with students; 3) stated positively; 4) specific; 5) publicly posted; 6) taught to students; 7) clearly tied to positive and negative consequences. All studies showed marked improvement in student behavior, but the role of rules in this improvement is not clear. The three studies implementing classroom rules as a stand-alone intervention concluded that rules alone did not exert much effect on behavior. Empirical evidence for the 7 commonly recommended characteristics of classroom rules was as follows: 1) There is no evidence clearly suggesting that rules should be few. The number of rules used by effective teachers varied widely, and authors recommend that teachers use the number of rules that best suits their classroom. 2) Involving students in the creation of rules has not yet been evaluated empirically. 3) Empirical support for stating rules positively was equivocal. Authors suggest stating rules positively where it makes sense to do so. 4) Most included studies used specific, rather than general rules. 5) Most included studies publicly posted rules or provided them as a handout. 6) In all studies the rules were taught to students. In the descriptive studies, teaching the rules was identified as one of the key distinguishing factors between most and least effective teachers. 7) In all studies the rules were clearly tied to consequences. Less effective teachers had fewer consequences, and did not deliver them as consistently or quickly. Authors conclude that the two most important characteristics of effective classroom rules are: 6) teaching the rules to students and 7) tying them to positive and/or negative consequences. Authors note the disparity between the emphasis given to rules in textbooks and other teacher-oriented literature, and the relatively

small amount of empirical research evaluating them, especially literature evaluating them alone, without other interventions.

Simonsen et al (2008) examined evidence-supported practices in classroom management (Gr K – 12) to decrease inappropriate and increase appropriate classroom behavior. Posting, teaching and reviewing expectations (rules), and providing feedback were associated with decreases in off-task and disruptive behavior; increases in academic engagement, leadership, and conflict resolution. Combining rule instruction with feedback and reinforcement yielded even better results. Results should be interpreted with caution as this review was of weak quality, scoring 1 out of 11 AMSTAR points.

Three reviews examined classroom or school rules in relation to bullying and school violence or victimization among children and adolescents. Meta-analysis showed classroom rules to be an important program element associated with a decrease in bullying (Farrington & Ttofi, 2009). Structure in the form of strong rules and regulations was significantly negatively associated with bullying. Negative school climate in the organizational dimension (e.g., low scores for rules and security) was significantly associated with higher levels of victimization for girls (Azeredo, Rinaldi, de Moraes, Levy, & Menezes, 2015). In schools where students felt that school rules were fair and consistently enforced, students reported stronger perceptions of safety, less violence and victimization, and teachers reported less bullying (Voight & Nation, 2016).

21.3.3. Comments

Rules are not usually used as a stand-alone intervention, however the reviewed evidence shows that they do have important effects on behavior both at home and at school.

21.4 Structure: Routines

21.4.1 Description

A routine is a regularly followed sequence of actions.

21.4.2. Review evidence

Two reviews examined bedtime routines in relation to sleep or bedtime problems, difficulty falling asleep, night waking and challenging behavior at bedtime in typically developing young children. Structured positive bedtime routines, which are set bedtime routines of quiet activities enjoyed by the children, had positive effects, although the number of included studies was small in both reviews (Meltzer & Mindell, 2014; Mindell, 2006).

21.4.3. Comments

There is not much evidence available on routines. The small amount of evidence reviewed here suggests positive effects, but more research is needed to confirm this. No reviews were found on family routines other than bedtime routines.

21.5. Structure: Sleep scheduling

21.5.1. Description

Sleep scheduling involves implementing a consistent sleep and wake time (including a consistent bedtime routine). Fixed naps during the daytime may also be included if appropriate. Sleep outside of the scheduled times is prevented. If the child wakes at night, interaction is kept to the minimum necessary to keep the child in bed.

21.5.2. Review evidence

One included review examined sleep scheduling in relation to sleep problems among children with severe to profound intellectual disability and serious behavioral disorders (Lancioni, O'Reilly, & Basili, 1999). In all cases, treatment duration was longer than 40 days. In two studies there was an improvement in sleep behavior for all participants. In the other 2 studies there were mixed findings, i.e., some improved and some did not, but in 1 case, night time sleep increased on average from under 2 hours a night to just over 7 hours, which must have been highly significant for the family (Lancioni et al., 1999).

21.5.3. Comments

No further reviews were found mentioning this intervention. Although it seems to have reduced sleep problems in some cases, there is not enough evidence to draw any firm conclusions about effectiveness.

21.6. Structure: Activity schedules

21.6.1. Description

Activity schedules are a sequence of visual cues (e.g., pictures or photographs) used to prompt, teach skills or reduce problem behavior. They can take various forms e.g., basic pictures or photographs, line drawings or video schedules. Some show one picture at a time, others show all the pictures at once.

21.6.2. Review evidence

Two reviews examined activity schedules for children and adolescents with ID in relation to independent performance of tasks (Koyama & Wang, 2011; Spriggs, Mims, van Dijk, & Knight, 2017). Activity schedules were effective for promoting independence for participants with intellectual disabilities, across various diagnoses and levels of intellectual functioning. Specific improvements reported included: independent transitions, correct response, task initiation, engagement and decreases in disruptive behavior (Koyama & Wang, 2011). In the other review, on visual activity schedules (VAS), all studies reported positive results for participants with ID, such as learning the target skills, improving transitions, increase in independence and increase in on-task behaviors. Social validity results showed that VAS were effective, easy to implement, non-intrusive and provided enjoyable learning experiences for participants (Spriggs et al., 2017).

Two reviews examined activity schedules for children and adolescents with ASD in relation to challenging behaviors and appropriate behaviors (Knight, Sartini, & Spriggs, 2015; Lequia, Machalicek, & Rispoli, 2012). The first found that, in all studies, VAS were effective in reducing challenging behavior and increasing appropriate behavior. No study reported negative findings. Activity schedules were effective regardless of format of activity schedule, severity of

ASD and comorbid diagnoses, age, gender and communication abilities, however there was variation across setting, with activity schedules being less effective in general education classrooms than in separate classrooms or separate schools. Authors suggest this could be because there would be more distractions in inclusive classrooms in general education, because there are more children. Authors note that the positive impact of activity schedules on challenging behavior for children with ASD is not surprising, since children with ASD often have a preference for visual learning and a strong need for predictability (Lequia et al., 2012).

Results of the other review (Knight et al., 2015) showed that VAS can be considered an evidence-based intervention for children and adolescents with ASD using Horner et al's criteria (Horner et al., 2005). In all 16 studies, VAS produced positive effects such as an increase in on-task behavior, decreased need for prompting, improvement in task and schedule completion steps, improvement in transitional behavior and improved latency time after students were directed to complete an activity. Both picture and video schedules were effective. 10 studies measured social validity, all reporting positive responses from adults, students or peers, with improved behavior as a result of schedule use (Knight et al., 2015).

21.6.3. Comments

The evidence reviewed here shows that visual activity schedules are a useful intervention to decrease challenging behavior, increase appropriate behavior and independence of children and adolescents with intellectual disabilities or ASD. Visual activity schedules may also be useful to typically developing children at home, but no reviews were found on this.

21.7. Structure: Scripts and script fading.

21.7.1. Description

Scripting is an intervention used for individuals with social communication difficulties, e.g., children with ASD. It involves presenting the child with a script as a model for a specific situation. This is to help them anticipate what could happen during an activity, and to improve their chances of appropriate participation. Scripts are usually practiced repeatedly before being used in a real situation. Once the child is able to use the script successfully in actual situations, the script is systematically faded.

21.7.2. Review evidence

Two reviews examined scripting and script fading as an intervention for children and adolescents with ASD in relation to social communication difficulties (Akers, Pyle, Higbee, Pyle, & Gerencser, 2016; Wong et al., 2015). Results showed increased social communication and increase in unscripted responses. Both visual and auditory scripts were effective. Researchers in 11 of the 16 studies were able to fade the scripts completely. Authors conclude that script fading is an empirically supported treatment (What Works Clearinghouse 2014) and an evidence-based practice (NPDC - Wong et al. 2013) (Akers et al., 2016). Wong et al. (2015) also found scripting to be effective for social communication difficulties, and that it meets criteria for classification as an evidence-based practice (WWC 5-3-20 guidelines) for children and adolescents with ASD (Wong et al., 2015).

21.7.3. Comments

The above evidence shows that scripting is an effective intervention and can be considered an evidence-based intervention for children and adolescents with ASD.

22. Time-out

22.1. Description

Timeout was originally called "time-out from reinforcement" (Wolf, Risley, & Mees, 1963), suggesting that the time-out condition should be less reinforcing for the child than the non-timeout condition (sometimes called time-in). It is most commonly used by caregivers for non-compliance and aggression (Everett, Hupp, & Olmi, 2010). Time-out is also used in school settings. Exclusionary timeout involves removing the student from the classroom, or environment they are in, for a short while, contingent on an inappropriate behavior such as aggression. With a non-exclusionary time-out, the student is not excluded from the venue, but is barred from participation in an activity or from receiving reinforcement for a while. This obviously has advantages in school settings, where students would miss academic instruction if sent out of the classroom.

22.2. Review evidence

Timeout was examined in seven included reviews, mainly in relation to compliance, or aggression and other externalizing behaviors. Three reviews examined timeout used in school settings, for children and adolescents, with and without behavior problems or disabilities (Kostewicz, 2010; Simonsen et al., 2008; Vegas, Jenson, & Kircher, 2007). All three reviews found time-outs effective in decreasing inappropriate behavior such as verbal or physical aggression or disruptive behavior. Meta-analysis (Vegas et al., 2007) found that they were particularly effective for verbal and physical aggression, with largest effects for boys under 7.

Both exclusionary and non-exclusionary time-outs were used in the above reviews, and both kinds were effective. One review (Kostewicz, 2010) focused solely on the non-exclusionary time-out. The other 2 reviews included studies on both kinds.

Kostewicz et al. (2010) reviewed studies using markers such as ribbons, wristbands or happy face cards. If students engaged in behaviors that interfered with educational instruction, such as yelling, out of seat, talking out of turn, inappropriate touching, banging objects on table, hitting others, throwing things or non-compliance, their ribbon / wristband / happy face card was removed for between 1 and 5 minutes, and returned at the end of the timeout. With this kind of time-out, reinforcement (such as praise, tokens or edibles) is only available to those who still have their ribbons / wristbands / cards. Results showed increased compliance and reduction or elimination of problem behaviors. The intervention was more effective at decreasing inappropriate, than increasing appropriate behaviors. Three studies measured and found evidence of maintenance. Teachers rated the procedure as highly acceptable and perceived the children as better group members (Kostewicz, 2010).

Another kind of non-exclusionary time-out used was contingent observation (Vegas et al. (2007). This involves the student observing, instead of participating, in an activity, such as a game, for a short while, contingent on an inappropriate behavior. A further example of non-exclusionary time-out, from a study reviewed by Simonsen et al.(2008), involved time-out from musical reinforcement. Popular music was played while a school bus was moving, as long as all children were sitting in their seats. Music was shut off for 5 seconds for each observed out-of-seat behavior.

Two reviews examined time-out implemented by parents in relation to compliance among children with and without disabilities or behavior problems such as identified noncompliance or ODD (Leijten et al., 2018; Owen et al., 2012). Time-out implemented by parents without harshness, criticism, yelling or insults consistently resulted in greater compliance. Effects were immediate and occurred regardless of the addition of praise or positive

nonverbal response (Owen et al., 2012). Meta-analysis of timeouts in which the parent took the child out of the situation in which noncompliance occurred, placing them in a separate part of the room, or another room, for a few minutes without social interaction, showed robust effects, increasing both observed and parent-reported compliance. Time-out had much stronger effects on compliance than verbal reprimands or praise. Review authors concluded that time-out promotes both immediate and short-term child compliance (Leijten et al., 2018).

Leijten et al. (2018) also examined an intervention called "ignoring", in which parents did not interact verbally or non-verbally with the child for a few minutes after non-compliance. The child was allowed to stay in the situation in which they had been non-compliant, but did not receive any parental attention. For the current overview, this intervention was coded as a non-exclusionary time-out (time-out from attention), rather than planned ignoring, in which only the target behavior would be ignored. Brief ignoring increased both observed and parent-reported child compliance. Ignoring had stronger effects on compliance than verbal reprimands or praise. Review authors concluded that this intervention promotes both immediate and short-term child compliance.

A meta-analysis of components associated with parent training program effectiveness for children 7 years and under (Kaminski et al., 2008) found that programs teaching parents to use time-out showed consistently and significantly larger positive effects on child externalizing behaviors such as noncompliance, aggression or hyperactive behavior.

Time-out was reviewed as an intervention for aggression in children and adolescents with mild to severe developmental disabilities (Matson et al., 2005). Results showed significant reduction in aggression. Authors noted that interventions need to be matched to the function of the behavior, as one study showed that time-out could reinforce the challenging behavior.

Lastly, a review of timeout used to address aggression, noncompliance, rule breaking or disruption, for children with and without disabilities (Corralejo, Jensen, Greathouse, & Ward, 2018) found that overall there is strong support for the use of time-out as an intervention for improving child behavior. The aim of this review was to update the parameters of time-out according to reviewed research findings. Results were as follows: Verbalized reason: Research thus far shows no benefit of a short, verbalized reason before or after time-out in terms of child compliance, but it does suggest that parents and other practitioners of timeout prefer to use them. Warning before time-out: No warning, or 1 short warning both reduce noncompliance, but more than one warning can increase noncompliance and warnings appear to increase aggression.; Verbal or physical administration: Only 1 study was found, showing that reducing time-out duration for compliance to verbal instruction to go to time-out, reduced the need for physical administration.; Location and supervision: It is clear that the time-out location needs to be less reinforcing than the time-in environment. This is considered the most important parameter. There is not enough evidence yet to determine what specific location (e.g., chair, corner, or room) is best (all have been effective), or whether in-room adult supervision is beneficial (only 1 study assed this and found time-outs with mothers in or out of the room were equally effective).; Schedule: Evidence suggests it is usually best to start with continuous use (every time the target behavior occurs), with the possibility of thinning to more intermittent use after sufficient progress.; Contingent vs non-contingent release: No significant benefit or harm (for overall outcome or within time-out behavior) has been found for using contingent over non-contingent release.; Duration: There is no evidence base for determining duration according to age. 5 minutes or less is usually sufficient and longer timeouts do not add any benefit. Sequencing effects are a common finding, i.e. that decreasing from an established duration usually results in

worse behavior, so it seems best to start with a shorter duration such as 1 or 2 min and increase if necessary; Time-out signal: There was no research available and so no conclusions could be drawn (Corralejo et al., 2018).

Other findings which could contribute to guidelines for caregivers about how time-outs should be implemented include that, in one study reviewed by Owen et al. (2012), there was significantly more compliance and less timeouts given with parent-controlled release than with child-controlled release, while Matson et al (2005) reported that adding a contingent extension to the time-out did not improve effectiveness.

Corralejo et al. (2018) compared recommendations on timeout from 27 of the most popular parenting books, and a number of the most popular parenting websites, with their updated parameters. Only books and websites giving specific advice on timeout were included, while those advising against timeout were excluded. Of those included, only around one third of recommendations were found to be consistent with empirical findings, while one out of five recommendations were clearly inconsistent with the evidence.

22.3. Comments

Timeouts have proved effective despite considerable variation in factors such as exact time-out location, whether or not a reason is given, or whether contingent or non-contingent release is used (Corralejo et al., 2018). This would suggest that parents and other practitioners could tailor these factors in their time-out protocols to suit the needs of specific children and situations, without compromising the effectiveness of the intervention.

In popular literature and internet advice, time-out has often been criticized or warned against (Durrant & Stewart-Tufescu, 2017; Siegel & Bryson, 2014a; Siegel & Payne Bryson, 2014b), but much of the information from these sources has been shown to be guilty of

inaccuracies and omissions (Corralejo et al., 2018; Drayton et al., 2014). Taken together, the above reviews show that there is a lot of evidence supporting time-out as an effective intervention, especially for aggression and other externalizing behaviors, and for compliance. No reviewed evidence showed harmful effects. It would seem, therefore, that it is worth protecting its place in the non-violent discipline toolkit.

A version of time-out has been suggested as an intervention to help aggressive or dysregulated children to calm down (Nelsen, 2011), but no reviews were found examining time-out used as a de-escalation tool. Life Space Crisis Intervention (Long, Wood, & Fecser, 2001), an approach to crisis intervention with children and adolescents, includes a step called "drain-off", which usually involves listening empathically to help "drain-off" heated emotions, but may also involve allowing the child some time to cool off on their own. Reviews of LSCI, as a whole, were not relevant to this overview, and no reviews were found of components such as drain-off, used separately. As mentioned in the section on communication, the lack of information on crisis intervention and de-escalation for children and adolescents is a serious gap in the literature. When we consider that discipline situations often involve dysregulation, anger and other heightened emotions, and that the behavior that may need containing may be violent, it is clear, that a review on time-out used in this way would be a valuable addition to the literature.

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