What does death have to do with drinking?

Enhancing implicit self-esteem in children

How do children experience their parents’ feeding practices?

Letter to the editor
The loss of happy life years associated with mental disorders
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**Publisher**
Wil Zeegers, Nederlands Instituut van Psychologen, PO Box 9921, 1006 AP Amsterdam, the Netherlands,
E-mail: wil.zeegers@psynip.nl

**Subscription rates**
Personal rate: € 125.–
Institutional rate: € 226.–
Student rate: € 62.50
All prices are per calendar year and include value added tax (VAT)
Price per issue: € 31.95 (incl. VAT)

**Subscription administration**
Performis Media, PO Box 2396, 5202 CJ ’s Hertogenbosch, the Netherlands, tel: +31 73 689 58 89. For information and orders, please consult www.performis.nl

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The Netherlands Journal of Psychology is published four times a year.

@ Nederlands Instituut van Psychologen 2011
ISSN 1872-552x
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The central paradox of addictive behaviour is that so many people continue this behaviour, even when they realise that it harms them (cf. Wiers & Stacy, 2006a,b). Given that many people understand that addictive behaviours often violate self-preservation and reproduction goals, there must be other reasons why people continue harmful use of alcohol and drugs despite all related problems. A possible reason, central in this paper, is that drinking might serve as a coping mechanism against fear of death. At first sight, this may seem far-fetched; what does death have to do with drinking? The hypothesis is based on the Terror Management Theory (TMT; for a review, see Greenberg, Solomon & Pyszczynski, 1997), which states that people have an existential death terror, which is countered with several defence mechanisms. In this study we test whether alcohol use could be conceived as such a defence mechanism, hence we test the TMTA (Terror Management Theory for Alcohol).

Terror Management Theory

Humans resemble animals in their instinct for self-preservation. However, humans are also aware that their life is finite, and according to TMT, this results in death terror. When people are made aware of their own mortality, proximal defences such as active suppression and denial counter the accessibility of death thoughts. But when proximal defences slacken over time (Greenberg, Arndt, Simon, Pyszczynski, & Solomon, 2000), or under high cognitive load (Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997b) death thoughts regain accessibility and distal defences may come into play.

Distal defences are thought to operate as a dual-component anxiety buffer, consisting of a cultural worldview and self-esteem. A cultural worldview consists of concepts and standards for understanding the world. It can provide a sense of symbolic immortality, such as the idea of contributing to something that goes beyond one's own life or a sense of literal immortality, such as belief in the existence of after-life or reincarnation (Dechesne et al., 2003). Believing in a cultural worldview is not enough to escape death terror: one must also believe that one is a valuable part of that world. In other words, one must have a sense of personal value and self-esteem (Greenberg et al., 1997). A number of studies have provided evidence for the dual-component anxiety buffer. When mortality is salient, people have more accessible worldviews (Arndt, Greenberg, &
Cook, 2002), form more positive impressions of people who adhere to their religion (Greenberg et al., 1990), and allocate higher penalties and are more aggressive to those who threaten their worldview (McGregor et al., 1998; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). When self-esteem is high (either as a trait or after manipulation), effects of mortality salience disappear (Harmon-Jones, Simon, Greenberg, Pyszczynski, Solomon, & McGregor, 1997). Conversely, when self-esteem is low, mortality salience leads people to enhance their self-esteem, for example, by attributing successes to oneself and failures to external factors (Mikulincer & Florian, 2002).

**Drinking alcohol as a distal defence mechanism**

There are several indications that drinking alcohol can serve as both a direct and an indirect defence against death terror. Alcohol provides direct psychoactive effects, and may therefore provide a way of dealing with conscious death concerns (Arndt, Goldenberg, Greenberg, Pyszczynski, & Solomon, 2000). Alcohol might also provide the two components of a distal defence suggested by TMT: a worldview and sufficient self-esteem. Especially for heavy drinkers, drinking alcohol and the rituals this involves might constitute a worldview, in the sense that people feel they belong to a group of drinkers (e.g. the usual crowd in a bar). Further, in both cross-sectional and longitudinal research, a robust inverse relationship between religiosity and alcohol use and abuse has been found (see for reviews, Booth & Martin, 1998; Gorsuch, 1995). This can be partly explained by the coherence hypothesis (George, Larson, Koenig, & McCullough, 2000), stating that religion reduces substance use by giving meaning and coherence to life, or in terms of TMT, providing a worldview. The second criteria for alcohol to be a distal defence is that it should enhance people’s self-esteem. People often drink to feel confident (an enhancement motive; Cooper, 1994). An inverse relation between self-esteem and drinking alcohol has been found in cross-sectional research (Luhtanen & Crocker, 2005; Pullen, 1994; Wills, 1994), but results of longitudinal research are mixed (Crocker, 2002; Wills, 1994; Zimmerman, Copeland, Shope, & Dielman, 1997).

The inverse relationship between alcohol use and both religion and self-esteem supports the view that drinking alcohol can provide the two ingredients of a distal defence against death terror. However, drinking constitutes a risk behaviour and thus in fact goes against the self-preservation instinct. TMT explains paradoxical defence mechanisms by indicating that the main function of distal defences is to take away death terror, not to enhance survival (Taubman Ben-Ari, Florian, & Mikulincer, 1999). Therefore, distal defences sometimes conflict both with proximal defences and with the instinct for self-preservation. When a risk behaviour is relevant to one’s self-esteem, it becomes more attractive under mortality salience conditions (e.g. sun tanning, Routledge, Arndt, & Goldenberg, 2004; reckless driving, Taubman Ben-Ari, Florian, & Mikulincer, 2000). In a review on Terror Management and Health Models, factors influencing whether mortality salience leads to health-defeating outcomes or health-facilitating outcomes are discussed (Goldenberg & Arndt, 2008).

To our knowledge, only two studies using mortality salience manipulations have focussed on substance use. In a study by Hirschberger and colleagues, participants indicated how willing they were to try an array of drugs, ranging from alcohol and cigarettes to ecstasy and cocaine (Hirschberger, Florian, Mikulincer, Goldenberg, & Pyszczynski, 2002). Three different scenarios were presented, in which drugs were being offered either under medical supervision by the University for research purposes, or by a close friend, or by a stranger at a party. When mortality was salient, men were more willing to use drugs in all three scenarios. For women, no effect was found. Cox and colleagues (Cox, Arndt, Goldenberg, & Piatecki, 2008) studied effects of mortality salience on smoking behaviour of casual and habitual smokers. They found that, when mortality was salient, casual smokers reduced their smoking behaviour, while habitual smokers increased their smoking. It can be reasoned that for habitual smokers, smoking is part of their worldview, and therefore serves as a distal defence. The current study further investigates substance use as a distal defence, with alcohol being the drug of interest and subliminal priming the means by which mortality salience was induced.

**This study**

In this study, mortality was made salient by priming participants with pictures of faces of dead people (mortality salience condition). Results were compared with a neutral control condition in which neutral faces were shown, and a negative affect contrast condition with painful faces. This last condition was included to distinguish between mortality salience and a general negative priming effect. In all conditions, the pictures were shown for 16 milliseconds and masked by neutral pictures. Using subliminal priming to
induce mortality salience has the advantage that participants are not aware of the manipulation and therefore cannot bias the results. Additionally, as death thoughts do not become consciously accessible, distal defences are activated without a delay or distraction (Arndt et al., 2002; Arndt et al., 1997b). In earlier experiments (Arndt, Allen, & Greenberg, 2001; Arndt et al., 2002; Arndt, Greenberg, Pyszczynski, & Solomon, 1997a), subliminal priming with death-related words successfully induced mortality salience. In this study, pictures of faces were presented as was done by Winkielman, Berridge, and Wilbarger (2005).

Effects of the priming procedure on desire to drink alcohol were measured with an alleged tasting session (similar to Marlatt, Demming & Reid, 1973), in which participants tasted and rated four drinks. The drinks were an alcoholic drink (beer), a placebo (non-alcoholic beer), a soft drink and an anti-placebo (soft drink with vodka). This within-subjects variety of the balanced placebo design (Marlatt & Rohsenow, 1980) was used in order to distinguish between the effects of expecting to drink alcohol and actually drinking alcohol. Dependent variables were the amount consumed and the ratings of the drinks. The design of the study was approved by the Institutional Review Board (Maastricht University).

It was expected that participants in the death condition would drink significantly more of the alcoholic beverages, and rate the alcoholic beverages more positively than participants in the neutral and pain conditions. Yet, according to TMT, a distal defence against death terror is only to be expected if self-esteem is low. Therefore, the mortality salience effect was expected to occur only in those participants with low self-esteem. Thus, the first hypothesis was that there would be a significant interaction between priming condition and self-esteem.

In previous terror management studies, mortality salience manipulations did not alter conscious affect. Therefore, it was not expected that the priming procedure used in this study would have an effect on subjective mood, which was measured at several points in the experiment. Hence, the second hypothesis was that mood would not change after the priming procedure (cf. Winkielman et al., 2005). The third hypothesis was that the primes used in the study would not reach conscious awareness, because they were shown for only 16 milliseconds, using both forward and backward masks.

### Method

**Participants**

Given less problematic ethical procedures for drinking alcohol in males (no risk of pregnancy) and the fact that heavy drinking is especially prevalent in male students, only men were recruited, resulting in a convenience sample of male students. Participants were recruited by posters, flyers and e-mails which presented the research as a combination of two independent experiments: a computer task and a tasting session with several drinks. Potential participants were administered a brief telephone interview to estimate their weekly alcohol use. Only students with an above average alcohol consumption of at least 12 Dutch standard drinks (containing approximately 10 grams of ethanol per drink) per week were included. Sixty male students with a mean age of 21.7 years (± 5.2, range 18-45) participated. Average alcoholic consumption per week was 28.5 (± 11.4) drinks. All participants were Caucasian. Three participants had to be excluded from the analyses; two of them completed the tasks in the wrong order, and the third could not complete the tasks because of language problems. All other participants were fluent in Dutch. This left an analytic sample of 57 participants, 19 per condition. Background characteristics of the sample can be found in Table 1.

### Materials

**Pictures in subliminal priming**

The pictures of the neutral faces were the same as used by Winkielman et al. (2005) and were originally developed by Matsumoto and Ekman (1988). Only the Caucasian faces were used, because of the great majority of Caucasian students at Maastricht University. The pictures of painful and dead faces were taken from the internet and from the International Affective Pictures System (IAPS) CD-ROM (Lang, Bradley, & Cuthbert, 1995). We selected dead faces which were clearly dead, to ensure that they would be perceived as dead rather than as asleep. These faces had often been

### Table 1  Background characteristics of the sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>21.70</td>
<td>5.22</td>
</tr>
<tr>
<td>Alcoholic drinks (per week)</td>
<td>28.50</td>
<td>11.42</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>2.76</td>
<td>0.55</td>
</tr>
<tr>
<td>Self-esteem through alcohol</td>
<td>2.92</td>
<td>0.51</td>
</tr>
<tr>
<td>Amount of hunger (scale: 1-10)</td>
<td>5.16</td>
<td>1.66</td>
</tr>
<tr>
<td>Amount of thirst (scale: 1-10)</td>
<td>3.89</td>
<td>2.47</td>
</tr>
<tr>
<td>Affect (valence, neg-pos)</td>
<td>6.63</td>
<td>1.34</td>
</tr>
<tr>
<td>Affect (arousal, low-high)</td>
<td>5.02</td>
<td>1.40</td>
</tr>
</tbody>
</table>
mutilated. The pictures were adapted with Adobe Photoshop to resemble the neutral pictures as much as possible in all aspects except for the contents (face with neutral background). The faces are available upon request. The primes and masks were presented to the participants in a computer task (described in more detail later) developed in E-Prime (Schneider, Eschman, & Zuccolotto, 2002).

**Questionnaires**

Mood was measured several times during the experiment with affect grids (Russell, Weiss, & Mendelsohn, 1989). The affect grid is a single-item scale in the form of a grid, on which participants indicate their arousal and valence. In four studies, the affect grid showed adequate reliability, convergent validity, and discriminant validity (Russell, et al., 1989).

Self-esteem was measured with the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1989). The internal consistency (Cronbach) of the scale was 0.89 in our sample.

Alcohol use was measured with a self-report questionnaire (Wiers, Hoogeveen, Sergeant, & Gunning, 1997). Participants indicated how many alcoholic beverages they had drunk on each day during the past week, and how many drinks they would normally consume on each day of the week. All beverages were converted to standard drinks. From these data, the average number of alcoholic drinks consumed per week was computed. Current thirst and hunger were assessed with a ten-point Likert scale.

**Dependent variable: alcohol consumption**

The tasting session included a light alcoholic beer (alcohol percentage of 3.5%), a non-alcoholic beer (placebo), a slightly sparkling soft drink, and the same soft drink mixed with 17.5 ml vodka (alcohol percentage of 3.5%, anti-placebo). Drinks were prepared in a separate room, and were all presented in neutral glasses of 200 ml each.

**Procedure**

The experiment was always conducted in the afternoon, because most people do not appreciate drinking alcohol in the morning. Per session, up to four participants were tested. To ensure privacy they were seated in individual cubicles and all instructions were printed in a booklet, so they could work individually and at their own pace. First their blood alcohol level was measured using a calibrated breathalyser to ensure that they were sober at the start of the experiment (all participants were). Then the procedure of the study was explained and participants filled out informed consent. Next, they indicated their current thirst, hunger and mood on the affect grid.

After that, they proceeded with the subliminal priming task, which was presented as a gender classification task (as in Winkielman et al., 2005). Neutral male and female faces had to be categorised using two response keys. Unknown to the participants, each face was preceded by a briefly presented other face which was neutral, painful or dead. Every trial started with a 50-ms presentation of a black cross that served as a fixation point and a forward mask. The cross was then replaced by the prime stimulus, which was shown for 16 ms. The prime was backward masked by a neutral face (the target), which was shown for 400 ms. The participant then had to press a ‘V’ if this was a woman, or an ‘M’ if it was a man. In total, there were eight priming trials. More trials may cause habituation to the primes (Whalen, Rauch, Etcoff, McInerney, Lee, & Jenike, 1998; Winkielman et al., 2005). After the gender classification task, participants were again asked to indicate their mood (affect grid).

Directly after this, participants were presented with a tray with the four different beverages. They were told that they would get ten minutes to rate the drinks on the accompanying forms. They could choose which drink they wanted to start with, and how much they wanted to drink. They rated the taste of the drinks and answered some filler questions that were included to ensure that the task would take a while, leaving enough time for the participants to drink as much as they wanted. After ten minutes, the experimenter came to pick up the tray and measured the amount of the drinks that was consumed (in another room). Participants then filled in another affect grid, the alcohol use questionnaire and the RSES.

Participants then proceeded to a forced choice recognition task, designed to measure perceptibility of the subliminal primes. They were informed that they had been primed in the first part of the experiment, and were told that the upcoming task would also contain primes. Their task was to pay attention to the primes and pick the prime from two alternative faces. The forced choice task consisted of 20 trials, similar to the gender classification trials (50 ms fixation point, 16 ms prime, 400 ms backward mask). The only difference was that after each trial, two faces appeared on the screen, from which the participant had to choose the face that had been presented as the prime. In the end, all primes used in the experiment were shown once more, this time supraliminally, and participants were to indicate the valence and the amount of arousal that the pictures evoked. Then they were asked what they thought the experiment was about. Once more, participants’ breath was measured, to assure that their blood alcohol level was below
legal limit. Participants were then debriefed, thanked and received a small monetary reward as compensation for their time.

Results

Manipulation checks

First it was checked whether there were any differences between the three conditions with respect to age, alcohol use, initial level of thirst and hunger, mood (both valence and arousal), self-esteem and self-esteem through alcohol. No such differences were found, all ps > .20. All participants rated the pictures on an affect grid, with valence scores ranging from 0 to 9. The neutral pictures were rated 5.9 on average, the pain pictures 2.5 and the death pictures 1.8. As expected, the neutral pictures differed significantly from the pain pictures, \( t(56) = 16.89, p < .001 \), and the death pictures, \( t(56) = 20.89, p < .001 \). However, the difference between the pain pictures and the death pictures was also significant, \( t(56) = 2.37, p < .05 \). The death pictures were thus rated significantly more negatively than the pain pictures and the neutral pictures. The average percentage correct on the forced choice task was 52.3%, which corresponds to 10.46 correct answers out of 20 trials. This score was found not to differ from chance level (10 items correct), \( t(56) = 1.49, p = .142 \), confirming the subliminal nature of the priming procedure used (Hypothesis 3).

In previous terror management research, mortality salience manipulations did not influence mood. The same was found for the present study. In repeated measure analysis, neither the effect of time (\( F(1,54) = .407, p > .50 \)), nor the interaction between time and condition (\( F(2,54) = .331, p > .50 \)) were significant. Thus, there was no effect of priming on conscious mood as measured by the affect grid (Hypothesis 2).

Prediction of drinking

Separate hierarchical regression analyses were conducted for the amount of drinks consumed and for the subjective ratings of the drinks.

Amount consumed of the different drinks

Descriptive statistics for the amount consumed are presented in Table 2. These data were subjected to a mixed multivariate analysis of variance (MANOVA), with drink as within-subjects factor (four levels) and condition as between-subjects factor (3 levels). The amount consumed differed significantly between the drinks, \( F(3,52) = 4.1, p = .01 \), therefore the drinks were analysed separately. The light alcoholic beer was consumed most, the non-alcoholic beer was consumed the least (the exact means can be found in Table 2). During the debriefing, many participants indicated that they disliked the non-alcoholic beer and immediately tasted that it was a fake. In addition, there were no differences between the soft drink and the soft drink with alcohol. Our initial intention had been to analyse separately for ‘think alcohol’ and ‘get alcohol’ conditions (as in a balanced placebo design, cf. Marlatt & Rohsenow, 1980). However, given the fact that the placebo drink did not work for many participants and that our hypotheses are primarily about the effects of alcohol, we report the analyses for the condition in which people thought they drank alcohol and also received alcohol (light beer), and for the ‘soft drink’ condition, in which people believed they received a non-alcoholic drink, and also received a non-alcoholic drink.

<table>
<thead>
<tr>
<th>Table 2 Descriptive statistics for amount consumed (in ml., possible values ranging from 0 to 200) and ratings of the drinks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amount consumed</strong></td>
</tr>
<tr>
<td><strong>Overall</strong></td>
</tr>
<tr>
<td><strong>Light alcoholic beer</strong></td>
</tr>
<tr>
<td>- Mean</td>
</tr>
<tr>
<td>- SD</td>
</tr>
<tr>
<td><strong>Soft drink</strong></td>
</tr>
<tr>
<td>- Mean</td>
</tr>
<tr>
<td>- SD</td>
</tr>
<tr>
<td><strong>Non-alcoholic beer</strong></td>
</tr>
<tr>
<td>- Mean</td>
</tr>
<tr>
<td>- SD</td>
</tr>
<tr>
<td><strong>Soft drink with vodka</strong></td>
</tr>
<tr>
<td>- Mean</td>
</tr>
<tr>
<td>- SD</td>
</tr>
</tbody>
</table>
Prediction of beer consumption

The regression analysis first included an array of covariates (thirst, hunger, mood, alcohol use, etc). If these variables did not significantly explain variance, they were deleted from the analysis. As the pain condition served as a negative emotion control condition, the pain and death conditions were coded into a dummy variable. A hierarchical regression analysis was conducted. One outlier was found, and removed from analysis. In the first step of hierarchical regression analysis, this dummy variable and self-esteem were entered. The resulting model was not significant ($p = .739$).

In the second step, the interaction between these two variables was entered. Adding the interaction to the regression produced a significant change in explained variance, $\Delta R^2 = .255$, $p = .002$ (Table 3). This model was significant ($p = .014$). The interaction is shown in Figure 1. In the death condition, participants with low self-esteem drank more beer than those with high self-esteem. This confirms the second expectation that mortality salience would increase beer consumption for participants with low self-esteem (Hypothesis 2).

Prediction of soft drink consumption

The same hierarchical regression analysis was performed for the amount of soft drink consumed. The model with self-esteem and the dummy variable was not significant ($p = .239$). Adding the interaction did not produce a significant change in explained variance ($\Delta R^2 = .090$, $p = .063$) and the resulting model was not significant ($p = .095$) (Table 4). This is in line with the expectation that mortality salience would not affect the consumption of the soft drink, although it should be noted that a statistical trend was observed in the same direction.

Ratings of the drinks

Descriptive statistics for the ratings of the drinks are shown in Table 2. Taste data from one participant in the neutral condition were lacking. The data were subjected to a mixed MANOVA, with drink as within-subjects factor (four levels) and condition as between-subjects factor (3 levels). The taste ratings differed significantly between the drinks, $F(3, 51) = 6.9, p < .001$. The alcoholic beer and both soft drinks were rated about equally positively, while the non-alcoholic beer was rated less positively (the exact means can be found in Table 2).

In keeping with the analyses of the amount consumed, we analysed the rating of the alcoholic beer and the soft drink, using the same hierarchical regression analyses as for the analyses of the amount consumed. The rating of
Discussion

The main results of the present study were that the Terror Management Theory for Alcohol was partially supported. Specifically, the main hypothesis of the study was that the subliminal presentation of faces of dead people would increase both consumption and positive ratings of alcohol, in comparison with subliminally presented neutral faces or painful faces, but only for people with low self-esteem. The results for the consumption of the drinks indeed supported this hypothesis. It was found that participants with low self-esteem drank more beer in the death condition than participants with high self-esteem. This was not found for soft drinks (although it should be noted that a trend in the same direction was observed). The results for the ratings of the drinks did not support the main hypothesis. No effects of condition, self-esteem or interaction were found for the ratings of beer and soft drinks.

Together these findings indicate that the subliminally presented faces did have some effect, even though they did not reach awareness, as was established both with a subjective criterion (asking the participants whether they had seen anything) and an objective criterion (the forced choice task). Also, it was shown that the priming procedure did not alter conscious affect, as in other terror management studies (Hypothesis 3).

The results of this study only partially support the Terror Management Theory of Alcohol. This might be explained by the fact that the student participants in this study may not have been heavy drinkers in the sense that their worldviews are alcohol related. When students graduate, their heavy drinking pattern often changes, parallel to the way their personal life changes at that moment. Because their heavy drinking pattern is temporary, it might be that their worldview does not centre on alcohol. Non-student heavy drinkers might differ from students in that their drinking pattern is permanent; their whole life is centred around drinking, as is their worldview.

As the results of this study only partially support the Terror Management Theory of Alcohol, future research is needed to examine the value of this theory. Clear results on this topic could have implications for treatment of alcohol abuse. Treatments could focus on establishing another, healthier worldview and on increasing self-esteem regarding that worldview, making alcohol redundant as a defence against death terror. This could be related to humanistic worldviews or to existing religions, such as Christianity as in Alcoholics Anonymous or Buddhism as in some recent interventions (Marlatt, 2002).

Author’s note

This study was done as a Master’s thesis at Maastricht University by Francine Aarts, supervised by Reinout W. Wiers, now at the University of Amsterdam. The authors wish to thank Lotte Voorham for cooperation in testing. Wiers was funded by ‘VIDI’ grant 452.02.005 from the Dutch National Science Foundation (NWO), at the time of the study, and now by ‘VICI’ grant, 453.08.001.
References


Enhancing implicit self-esteem in children: Can a smile make you feel worthwhile?

These experiments represent a first exploration of implicit and explicit self-esteem in children, and test their malleability using the evaluative conditioning procedure that was successfully employed in adults (Baccus, Baldwin, & Packer, 2004). Experiment 1 showed that children for whom self-relevant information was repeatedly paired with smiling adult faces displayed somewhat higher implicit self-esteem and less aggression than controls. These findings were not replicated, however, in Experiment 2 that used a pre-post test design. In Experiment 3, repetition of the conditioning procedure did not produce significant effects on self-esteem or psychological functioning. Overall, pairing smiling faces with self-relevant information had no effect on children’s implicit or explicit self-esteem, and no consistent relations between implicit and explicit self-esteem measures were found. Implications and future research are discussed.


Keywords: Implicit self-esteem; Self-esteem enhancement; Evaluative conditioning; Children; Aggression

Authors: Jorg Huijding*, Arjan E. R. Bos** and Peter Muris*

Self-esteem, the overall evaluation of one’s worth or value as a person, is a construct that plays an important role in the mental and social development of children and adolescents (e.g., Harter, 1999). Research has shown that high self-esteem is related to parental approval, peer-support, adjustment, and success in school (Steinberg & Sheffield Morris, 2001). Conversely, children with low self-esteem have been found to be less successful in school and are less accepted by their peers (e.g., Mann, Hosman, Schaalma, & De Vries, 2004; Bos, Muris, Mulkens, & Schaalma, 2006). In addition, low self-esteem is related to several forms of child and adolescent psychopathology including anxiety (Beck, Brown, Steer, Kuyken, & Grisham, 2001; Muris, Meesters, & Fijen, 2003a), depression (Harter, 1993; Mann et al., 2004), and eating pathology (e.g. Muris, Meesters, Van de Blom, & Mayer, 2005; Stice, 2002). Self-esteem has also been linked with externalising problems such as aggressive and delinquent behaviours. However, there is still debate concerning the exact nature of this relation. While some researchers have found low self-esteem to be related to externalising problems (Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005), others have argued that externalising problems are related to high self-esteem as a result of egotism (Baumeister, Smart, & Boden, 1996).

The majority of research on self-esteem has focused on self-reported, or explicit, self-esteem (see Butler & Gasson, 2005 for an overview), which refers to conscious and deliberate evaluations of the self, self-relevant objects and situations. More recently, however, it is increasingly acknowledged that there are also more automatic self-evaluative processes that are not necessarily conscious (e.g., Greenwald & Farnham, 2000), and eating pathology (e.g. Muris, Meesters, Van de Blom, & Mayer, 2005; Stice, 2002). Self-esteem has also been linked with externalising problems such as aggressive and delinquent behaviours. However, there is still debate concerning the exact nature of this relation. While some researchers have found low self-esteem to be related to externalising problems (Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005), others have argued that externalising problems are related to high self-esteem as a result of egotism (Baumeister, Smart, & Boden, 1996).

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experience more anxiety during a very personal interview (Spalding & Hardin, 1999) compared with individuals with high implicit self-esteem. In addition, individuals who score high on a measure of social anxiety show lower implicit self-esteem than individuals who score low on such a measure (De Jong, 2002; Tanner, Stopa, & De Houwer, 2006).

Taken together, the existing data suggest that both a low explicit and a low implicit self-esteem are associated with a range of negative consequences. Importantly, the effects of implicit and explicit self-esteem seem to be complementary rather than identical (Dijksterhuis, Albers, & Bongers, 2007). That is, they each appear to explain unique variance on various outcome measures. This underlines the importance of including measures of both implicit and explicit self-esteem when studying the effects of self-esteem on psychological functioning.

Given the risk that low self-esteem may have for a healthy development, several interventions have been developed that aim to enhance children’s self-esteem (see Bos et al., 2006). A meta-analysis by Haney and Durlak (1998) showed that such interventions have modest effects on explicit self-esteem (with a mean effect size of 0.27). Recently, evidence in the adult literature suggests that implicit self-esteem can also be successfully enhanced (Baccus, Baldwin, & Packer, 2004; Dijksterhuis, 2004). For instance, Baccus et al. (2004) found that implicit self-esteem can be increased using an evaluative conditioning paradigm in which self-relevant stimuli (e.g., first name, date of birth) were consequently paired with pictures of smiling faces, and other-relevant stimuli were always followed by neutral or angry faces. Importantly, this procedure not only seemed to promote implicit self-esteem relative to other-esteem, but also appeared to have an effect on a measure of aggression. That is, participants who received positive reinforcement during the conditioning task were less aggressive than participants for whom self and other-relevant stimuli were equally often followed by pictures of smiling, neutral and angry faces. This suggests that implicit self-esteem can be enhanced and that this positive effect generalises to behaviours that are assumed to be related to self-esteem, such as aggression. Meanwhile, as self-relevant stimuli were always followed by smiling faces, but other-relevant stimuli always by negative and neutral faces it is difficult to know whether the effects were due to a strengthening of positive associations with the self, a strengthening of negative associations with others, or a combination of both. In addition, there are no published studies that have examined whether implicit self-esteem can be enhanced in children and adolescents. In fact, to our knowledge, there are no published studies at all that focus on implicit self-esteem in children, and, consequently, there are virtually no data available concerning the relation between implicit and explicit self-esteem in children, and the psychological correlates of implicit self-esteem outside adulthood.

The main purpose of the present series of experiments was to take a first step in filling the gap in our knowledge concerning implicit self-esteem in childhood by assessing implicit and explicit self-esteem in various samples of primary school children. We employed the conditioning paradigm that was successfully used by Baccus and colleagues (2004) and tested whether this experimental procedure can be used to enhance implicit and explicit self-esteem in primary school children. In order to test the net effect of the positive conditioning procedure for self-relevant stimuli, the conditioning procedure of Baccus et al. (2004) was slightly modified. That is, instead of always pairing other-relevant stimuli with negative or neutral faces, we paired these stimuli equally often with positive, negative or neutral faces (see method section of Experiment 1 for details). In all experiments we focused on youths in middle childhood, because children in this age range are assumed to be capable of integrating both positive and negative evaluations about themselves and as such form a more realistic representation of their overall self-worth (Harter, 1999). As such, this age range seems suitable for examining inter-individual differences in implicit and explicit self-esteem, and the relations between both types of self-esteem and other variables of interest, such as aggression and psychological functioning. Younger children typically make very positive self-attributions, due to an inability to distinguish between the real and the ideal self, an overestimation of their own virtuosity, and all-or-nothing thinking (Harter, 1999).

Experiment 1 was designed to test whether we could replicate the basic findings of Baccus et al. (2004) in a group of primary school children. Children were given a conditioning task that closely followed the procedure as described by these researchers. Subsequently, children completed measures of implicit self-esteem, explicit self-esteem, and aggression. Because Experiment 1 only included post-assessments and any lack of effects might be caused by differences between the experimental and the control group prior to the conditioning procedure, Experiments 2 and 3 used a pre-post test design. As a subsidiary issue, Experiment 2 was designed to test whether any effects of the conditioning procedure on implicit or explicit self-esteem and aggression

1 Note that even though Baccus and colleagues analysed only the ‘self’ trials in order to avoid this problem, research on the implicit measure that was used suggests that the approach of analysing just trials from one of the two target categories is not a valid one (Nosek, et al., 2007). As a result, one cannot conclude that the results of this earlier study were entirely about associations with the self only.
would be stable over longer time periods. Therefore, this experiment included a follow-up assessment of one month. Finally, Experiment 3 tested whether the effect on children’s self-esteem and general psychological functioning can be enhanced if the conditioning task is completed repeatedly. Because previous studies consistently observed differences between boys and girls in explicit self-esteem (e.g., Kling, Hyde, Showers, & Buswell, 1999; Robins, Trzesniewski, Tracy, Gosling, & Potter, 2002), we examined the influence of gender in all experiments.

Experiment 1

Method

Participants

A total of 133 primary school children (67 boys, 66 girls) aged between 9 and 12 years (M = 11.2, SD = 0.71) participated after obtaining written consent from the children themselves and their parents. All participants were randomly assigned to either the experimental or the control condition. There were no differences with regard to gender distribution, χ²(1, N = 133) < 1, and age, t(131) < 1, between the experimental and the control condition.

Materials

Explicit self-esteem. To assess global self-esteem the children completed the Dutch version of the Rosenberg Self-Esteem Scale (RSES: Rosenberg, 1965). The RSES consists of ten items that assess global feelings of self-esteem on a four-point Likert scale. The internal consistency of the RSES was acceptable in the present sample (Cronbach’s α = .67).

Children also completed the Dutch version of the Self-Perception Profile for Children (SPPC: Harter, 1985; Veerman, Straathof, Treffers, Van den Bergh, & Ten Brink, 1997). The 36-item SPPC is the most widely used self-report measure for assessing self-esteem in youths, and the Dutch version of this scale has satisfactory reliability with good internal consistency and test-retest stability (Muris, et al., 2003). In the present sample the internal consistency of the total scale was good (α = .90).

Implicit self-esteem. Similar to Baccus et al. (2004), the present experiment employed the self-esteem IAT (Greenwald & Farnham, 2000) as a measure of implicit self-esteem. The IAT was adapted especially for the use with children following the procedure described by Field and Lawson (2003). The tasks were run on laptop computers using E-prime software (Version 1.0, Schneider, Eschman, & Zuccolotto, 2002) to ensure high precision accuracy of reaction time recordings. The IAT required children to categorise words into self and other categories, and positive and negative categories using two response keys. In accordance with the standard IAT design (Greenwald, McGhee, & Schwarz, 1998), the task consisted of two critical sets of trials, the compatible block and the incompatible block. In the compatible block, children were asked to use one key to categorise self (e.g., self, me, my) and positive words (e.g., nice, good, smart), and the other key to categorise other (e.g., other, they, them) and negative words (e.g., stupid, dumb, bad). In the incompatible block, children were instructed to use one key to categorise self and negative words and the other key to categorise other and positive words. The idea behind the task is that participants will perform better when the two concepts that share a response key are somehow associated in memory then when they are not. Following this, implicit self-esteem can be computed as the difference in performance between the compatible and incompatible blocks (see for details Greenwald, Nosek, & Banaji, 2003). The entire IAT procedure consisted of seven phases: (1) practice categorising self and other words (10 trials); (2) practice categorising positive and negative words (10 trials); (3) practice the compatible categorisation of all words (20 trials); (4) critical compatible categorisation of all words (20 trials); (5) practice of reversed key assignments for the self and other words (30 trials); (6) practice the incompatible categorisation of all words (20 trials); (7) critical incompatible categorisation of all words (40 trials). Words were categorised by pressing the ‘E’ or the ‘I’ on the keyboard. Key assignments were counterbalanced across participants. Before each stage children received instructions on the response keys that represented each of the categories, and were then asked to categorise the words as fast and accurately as possible. To remind children of these instructions during the task, category labels were shown in the upper left and right corners of the screen throughout each stage. Each trial started with the presentation of a fixation dot in the middle of the computer screen. After 500 ms the fixation dot was replaced by the stimulus word. If a word was miscategorised then a red ‘X’ appeared under the stimulus. Both the stimulus and the cross then remained on the screen until the correct categorisation was made. Note, however, that only the latency until the initial response was recorded. After the correct categorisation was made the stimulus was immediately replaced by the fixation dot for the next trial. In total the task took about ten minutes for the children to complete.

An IAT score was calculated for each child on the basis of the scoring algorithm as proposed by
Greenwald and colleagues (2003). More specifically, we calculated the recommended \( D_4 \) measure that includes both combined practice and test phases and replaces errors with a 600 ms penalty. The Spearman-Brown corrected split-half reliability of this measure was reasonable \( (r = .59) \). Data of five children in the experimental and three children in the control condition were excluded from the analyses because they had more than 25% errors on the IAT. In addition, data from one child in the experimental group was excluded because he was more than 3 standard deviations removed from the mean score of his group.

Aggression. Aggression was measured by means of an adapted version of the ‘hot sauce test’ (Lieberman, Solomon, Greenberg, & McGregor, 1999). Under a cover story that we wanted their help in a taste experiment, children were presented with a cup that was filled for a quarter with a red, hot (spicy) sauce. Children were told that another participant had tasted and rated the sauce as very spicy, and had then decided for them that they should eat this amount of it. They were then asked to taste the sauce and indicate how much sauce they would like this other participant to eat in return. Children indicated the amount of sauce on a drawing of a cup. Finally, each child rated on a 100 mm Visual Analogue Scale (VAS) how much they liked or disliked the sauce \((0 = \text{very tasty, 100 = very nasty})\). As an index of aggression we took the product of the amount of sauce (distance in mm from the bottom of the cup up to the line marked by the children) and the VAS rating of the sauce.

Data from seven children (3 from the experimental and 4 from the control condition) were missing because these children refused to complete the hot sauce task.

Conditioning procedure. The conditioning procedure was designed after Baccus et al. (2004). Participants started by entering personal information about themselves (i.e., first name, last name, date of birth, place of birth, first letter of first name) into the computer. Then they were told that a word would appear randomly in one of the quadrants on the computer screen and that their task was to click on that word as fast as possible. They were instructed that clicking on the correct quadrant would cause an image to be displayed briefly (for 400 ms) in that quadrant. This procedure was repeated for 240 trials. The presented words were randomly chosen from the personal information that was entered at the start of the session (self-relevant words) as well as from a pre-programmed list of other-relevant words that fitted the same categories. Half of the trials were self-relevant and the other half were other-relevant. In the experimental condition self-relevant items were always followed by an image of a smiling adult face (120 trials), whereas other-relevant items were followed randomly by an image of a smiling, angry or neutral adult face (120 trials). In the control condition all items (self and other-relevant) were followed randomly by an image of a smiling, angry or neutral adult face. The faces were equally often male and female and derived from the MacBrain Face Stimulus Set (NimStim). The conditioning procedure took about seven minutes to complete.

Procedure

All children were tested individually in a separate room at their school. After the initial instruction, participants first completed the RSES. Then, children were seated in front of the laptop computer and completed either the experimental or the control version of the conditioning task. Following the conditioning task they completed the IAT. Upon finishing the IAT, participants were asked to fill in the Self-Perception Profile for Children. Finally, the children completed the ‘hot-sauce test’. Children needed about 30 minutes to complete all tests.

Results

Pre-experimental group differences

Descriptive statistics are shown in Table 1. A 2 (Condition: experimental vs. control) x 2 (Gender: girls vs. boys) analysis of variance (ANOVA) performed on the RSES total score only yielded a significant main effect of Gender, \( F(1, 129) = 4.7, p < .05 \), partial \( \eta^2 = .04 \): boys displayed significantly

<p>| Table 1 Mean scores (standard deviations) on self-esteem and aggression measures for both conditions in Experiment 1 |</p>
<table>
<thead>
<tr>
<th>Condition</th>
<th>Experimental ( (n = 67) )</th>
<th>Control ( (n = 66) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSES</td>
<td>31.4 (4.1)</td>
<td>30.8 (3.8)</td>
</tr>
<tr>
<td>SPCC</td>
<td>98.4 (1.5)</td>
<td>100.0 (1.5)</td>
</tr>
<tr>
<td>IAT</td>
<td>0.76 (0.32)( ^a )</td>
<td>0.68 (0.28)( ^a )</td>
</tr>
<tr>
<td>Aggression</td>
<td>1233.0 (172.7)( ^a )</td>
<td>1817.2 (172.1)( ^a )</td>
</tr>
</tbody>
</table>

3 Stimuli can be obtained from the first author. The MacBrain Face Stimulus Set was developed by Nim Tottenham and supported by the John D. and Catherine T. MacArthur Foundation Research Network on Early Experience and Brain Development. Please contact Nim Tottenham at tot00068@tc.umn.edu for more information concerning the MacBrain Face Stimulus Set.
higher RSES scores (M = 30.8, SD = 3.1) than did girls (M = 29.6, SD = 3.1). Importantly, there were no group differences on self-esteem before the conditioning procedure. That is, the main effect of Condition and the interaction of Condition with Gender were both non-significant, both F(1, 129) < 1.

Post-experimental group differences

SPPC. In order to examine children’s explicit self-esteem after the experimental manipulation, SPPC total scores were subjected to a 2 (Condition) x 2 (Gender) ANCOVA with the pretest RSES scores as the covariate. As can be seen in Table 1, children in the experimental and the control condition had comparable SPPC scores, F(1, 126) < 1. As indicated by a significant main effect of Gender, F(1, 126) = 4.0, p < .05, partial η² = .03, boys displayed generally higher SPPC scores (estimated marginal M = 101.3, SE = 1.7) than did girls (estimated marginal M = 97.1, SE = 1.3). The covariate was significant, F(1, 126) = 29.6, p < .01, η² = .19.

IAT. A 2 (Condition) x 2 (Gender) ANOVA performed on Children’s IAT scores revealed that the main effect of Condition showed a trend towards significance, F(1, 125) = 2.8, p = .097, partial η² = .02. Table 1 shows that children in the experimental condition exhibited somewhat higher IAT scores than children in the control condition. The main effect of Gender and the Condition x Gender interaction were non-significant, both F(1, 123)s < 1.

Aggression. A 2 (Condition) x 2 (Gender) ANCOVA of the aggression data, with the RSES scores as the covariate, yielded a significant main effect of Condition, F(1, 121) = 5.7, p < .05, partial η² = .05. As expected, children in the experimental condition showed less aggression than children in the control condition (see also Table 1). The covariate was also significant, F(1, 121) = 5.4, p < .05, partial η² = .04. The main effect of Gender and the interaction of Condition x Gender were both non-significant, both F(1, 121)s < 1. It is important to note that the two groups did not differ in their evaluation of the sauce, t(124) < 1.

Relation between Implicit and Explicit Self-esteem. The IAT was not significantly correlated with either the pretest RSES, r = .03, or the posttest SPPC, r = .06. The RSES and SPPC did show a significant correlation, r = .46, p < .01, indicating that higher self-reported self-esteem on the pretest was associated with higher self-reported self-esteem on the posttest.

Relation between self-esteem and aggression. The RSES showed a significant negative correlation with the measure of aggression (r = -.22, p < .05), indicating that lower levels of self-reported self-esteem at pretest were associated with higher levels of aggression at posttest. Neither the SPPC nor the IAT correlated significantly with the measure of aggression, r = -.08 and r = .04, respectively.

Discussion

Consistent with Baccus et al. (2004), participants who completed the experimental conditioning procedure in which self-relevant stimuli were consistently paired with smiling faces, tended to show enhanced implicit self-esteem and less aggression as compared with participants in the control condition. This is the first tentative demonstration that implicit self-esteem may be experimentally enhanced in children, and that a conditioning procedure may have an effect on aggression. It should be noted, however, that both effects were rather small and certainly require replication. In addition, no meaningful relations were found between aggression and measures of implicit and explicit self-esteem, which casts doubt on the idea that self-esteem is related to aggression in this age group. Meanwhile, an alternative explanation is that the currently used measure of aggression, the hot sauce test, did not provide a valid index of aggression in the present context. That is, although the hot sauce test has proven to be a reliable and valid measure of behavioural aggression in adults (Lieberman et al., 1999), it may have been too abstract and complex for children of this age. Related to this, the aggression index was based on a single item, which may have undermined the reliability of the assessment in the present experiments. For these reasons Experiment 2 included an aggression questionnaire that was especially designed to measure aggressive tendencies in youths on a continuous scale.

Although the first experiment yielded potentially interesting results, one important limitation of this experiment is that, despite the random allocation of participants to the experimental and the control condition, it cannot be precluded that the trend towards group differences following the conditioning task was due to pre-existing differences between both conditions, rather than to the experimental manipulation. In order to take potential pre-existing group differences into account a pre-post test design would be required. In addition, given the small size of the effects in Experiment 1, the use of a repeated measures design would have the additional advantage of offering more statistical power.

Following this, Experiments 2 and 3 were designed to further explore whether self-esteem can be
enhanced with the conditioning procedure employed in Experiment 1 using a pre-post test design. In addition, to provide more convincing evidence of changes in implicit self-esteem an additional measure of implicit self-esteem was added, the Name Letter Preference Task (Nuttin, 1985). As a subsidiary issue, Experiments 2 and 3 were designed to test whether any effects of the conditioning procedure would be stable over longer time periods. Therefore, both experiments included a one-month follow-up. Experiment 2 further explored the effect of the conditioning procedure on self-esteem and aggression, and included an alternative aggression measure that assessed both reactive and proactive aggression. Experiment 3 investigated the effect of the conditioning procedure on self-esteem and general psychological functioning, and therefore included the Strengths and Difficulties Questionnaire (Goodman, 2001). Finally, given the small size of the effects as obtained in Experiment 1, an additional goal of Experiment 3 was to examine whether repetition of the conditioning procedure would bolster the effects on children’s self-esteem.

Experiment 2

Method

Participants

A total of 106 primary school children (47 boys, 59 girls) were randomly assigned to either the experimental or the control condition after obtaining written consent from the children and their parents. Children were aged between 10 and 13 years (M = 11.2, SD = 0.77). There were no differences with respect to gender, $\chi^2(1, N = 106) < 1$, and age, t(104) < 1, between the experimental and the control condition.

Materials

Explicit self-esteem. To reduce experiment burden only the global self-esteem scale of the SPPC was used in the present experiment. The internal consistency of this scale was good with alphas of .85, .88, and .91, at the pretest, posttest and follow-up assessments respectively. Test-retest stability in the control group was high from pretest to posttest ($r = .90, p < .01$) and from posttest to follow-up ($r = .80, p < .01$).

Implicit self-esteem. To assess implicit self-esteem we used an IAT that was identical to the one employed in Experiment 1. Spearman-Brown corrected split-half reliability varied over the different assessments ($r$’s being .64, .39, and .56, respectively). Test-retest correlations in the control group were significant from pretest to posttest, $r = .32, p < .05$, and from posttest to follow-up, $r = .39, p < .05$. Data were treated similarly as in Experiment 1. Data of children who made more than 25% errors and from children that were more than 3 standard deviations removed from the group mean were excluded from the analyses. All in all, the final N for the analysis was 86 (45 in the experimental and 41 in the control condition).

The Name Letter Preference Task (NLPT: Nuttin, 1985) was used as an additional index of implicit self-esteem. The NLPT assesses how well individuals like their own initials relative to the other letters of the alphabet (see Koole & De Hart, 2007; Krizan & Suls, 2008). In the present experiment children were presented with all 26 letters of the Dutch alphabet, which appeared one by one and in a random order on a computer screen. Beneath each letter five square boxes appeared which were labelled ‘not at all beautiful’, ‘somewhat beautiful’, ‘beautiful’, ‘very beautiful’, and ‘extremely beautiful’. For each letter, the children were asked to click on the box that corresponded best with their evaluation of the letter on screen. Thus, the attractiveness of each letter was rated on a five-point scale. Calculation of the Name Letter Preference Task (NLPT) effect was based on previous studies by Koole and colleagues (2001) and Franck, De Raedt, and De Houwer (2007). As a first step, the rating of each individual letter for each participant was corrected for inter-individual differences in rating tendencies by Z-transforming it using the mean and standard deviation of all letter ratings of that participant. Next, a baseline score was calculated for each letter of the alphabet by taking the mean of each letter for all participants that did not have that letter in their first or last name. For the pretest assessment the baseline scores were calculated on the basis of the entire sample, for the posttest and follow-up assessments, the baseline scores were calculated for each group (experimental, control) separately. Following this, separate name letter effects were calculated for the first letter of the first and last name of each participant by subtracting the baseline score from the participants’ Z-transformed rating for that letter. Finally, a total name letter preference score was obtained by averaging both NLPT effects. The final N for the data analysis was 86 (45 in the experimental and 41 in the control condition). Test-retest correlations in the control group were significant both from pretest to posttest, $r = .60, p < .01$, and from posttest to follow-up, $r = .63, p < .01$. However, correlations between the name letter effects for the first and last name were very low ($r$’s .01, .00, and .15, respectively), indicating poor internal consistency.

Aggression. As a measure of aggression we included a ten-item aggression questionnaire...
that was especially designed for measuring aggressive tendencies in youths, the Aggression Questionnaire for Youths (AQY). Children were presented with ten situations and asked to rate on a six-point scale, varying from 0 = ‘nothing’ to 5 = ‘very much’, how much of a specific agent (e.g., water, itching powder, chewing gum) they would use against another child if they were in that particular situation. Factor analysis demonstrated that the questionnaire consists of two factors, pertaining to reactive and proactive aggressive actions against others. Supporting the validity of the AQY, pilot work showed both subscales are significantly related the Child Rating Scale for Aggression (CRA: Meesters, Muris, & Van Rooijen, 2007). Both subscales displayed acceptable internal consistency. For the reactive subscale alpha ranged from .85 to .92, while for the proactive subscale the alpha ranged from .65 to .79. Further, in spite of the experimental manipulation, test-retest correlations ranged from .71 (pretest to follow-up) to .86 (posttest to follow-up), for the reactive subscale and from .60 (pretest to follow-up) to .70 (posttest to follow-up) for the proactive subscale, suggesting adequate test-retest stability over time.

**Conditioning procedure.** The conditioning task was identical to the one used in Experiment 1.

**Table 2. Mean scores (standard deviations) on various self-esteem and aggression measures in both conditions obtained at the pretest, posttest, and follow-up assessments in Experiment 2**

<table>
<thead>
<tr>
<th></th>
<th>Condition (n = 55)</th>
<th>Control (n = 51)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SPCC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>19.6 (3.1)</td>
<td>20.0 (3.0)</td>
</tr>
<tr>
<td>Post</td>
<td>19.8 (3.2)</td>
<td>20.0 (3.2)</td>
</tr>
<tr>
<td>Fu</td>
<td>20.0 (3.8)</td>
<td>20.1 (3.1)</td>
</tr>
<tr>
<td><strong>IAT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>0.39 (0.33)</td>
<td>0.44 (0.40)</td>
</tr>
<tr>
<td>Post</td>
<td>0.58 (0.26)</td>
<td>0.60 (0.34)</td>
</tr>
<tr>
<td>Fu</td>
<td>0.59 (0.31)</td>
<td>0.63 (0.28)</td>
</tr>
<tr>
<td><strong>NLPT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>0.62 (0.62)</td>
<td>0.61 (0.74)</td>
</tr>
<tr>
<td>Post</td>
<td>0.82 (0.68)</td>
<td>0.76 (0.74)</td>
</tr>
<tr>
<td>Fu</td>
<td>0.80 (0.70)</td>
<td>0.72 (0.74)</td>
</tr>
<tr>
<td><strong>AQY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>11.4 (7.6)</td>
<td>12.1 (8.0)</td>
</tr>
<tr>
<td>Post</td>
<td>12.3 (8.8)</td>
<td>14.0 (8.6)</td>
</tr>
<tr>
<td>Fu</td>
<td>12.4 (9.0)</td>
<td>13.0 (8.0)</td>
</tr>
</tbody>
</table>

SPPC = Self Perception Profile for Children; IAT = Implicit Association Test (positive scores indicate positive self-esteem); NLPT = Name Letter Preference Task (positive scores indicate positive self-esteem); AQY = Aggression Questionaire for Youths; Fu = follow-up. N’s vary across variables and assessments due to missing and/or excluded data; reported means are based on the data included in the analyses.

**Procedure**

Children were tested in small groups with a maximum of four children in a separate room at school. The experimenter was present at all times and the children were seated facing away from each other at different ends of the room to ensure that they would not distract each other during the assessments. In order to control for group differences before the conditioning task, a pre-post test design was used. To reduce the potential influence of test-retest effects participants completed the pretest assessment one day before they completed the conditioning task. The posttest assessment was completed immediately after the conditioning task. After one month the experimenter returned for the follow-up assessment. During all assessments children first received a brief introduction and then consecutively completed the IAT, NLPT, SPPC, and the AQY.

**Results**

Descriptive statistics for children in both conditions at various assessments are shown in Table 2.

**Explicit self-esteem**

A 2 (Condition: experimental vs. control) x 2 (Gender: girls vs. boys) x 3 (Assessment: pretest, posttest, follow-up) ANOVA on children’s SPPC scores showed that none of the main or interaction effects were significant (all Fs < 1.2, p > .2). Thus, the SPPC scores remained stable over the three assessments, and were independent of Condition and Gender.

**Implicit self-esteem**

**IAT.** Children’s IAT scores were subjected to a 2 (Condition: experimental vs. control) x 2 (Gender) x 3 (Assessment) ANOVA, with the last factor being a repeated measure. Only the main effect of Assessment reached significance, $F(2, 81) = 11.1, p < .01$, partial $\eta^2 = .22$. Post-hoc comparisons showed that, irrespective of Condition or Gender, children showed increasing IAT scores from the pretest ($M = .45, SD = .32$) to the posttest ($M = .62, SD = .27$) assessment, $F(1, 71) = 19.6, p < .01$, partial $\eta^2 = .22$. The IAT scores remained stable from the posttest to the follow-up assessment, $F(1, 71) < 1$.

**NLPT.** Children’s NLPT effects were subjected to a 2 (Condition) x 2 (Gender) x 3 (Assessment) ANOVA, with the last factor being a repeated measure. Only the main effect of Assessment was significant, $F(2, 99) = 3.4, p < .05$, partial $\eta^2 = .06$. Within-subject contrasts indicated that this effect was due to the difference between the pretest ($M = .61, SD = .68$) and the posttest ($M = .79, SD = .71$) assessment, $F(1,100) = 6.6, p < .05$, partial $\eta^2 = .06$. The difference between the posttest and the follow-up ($M = .76, SD = .72$) assessment was not significant, $F(1, 100) < 1$. 

---

**Table 2. Mean scores (standard deviations) on various self-esteem and aggression measures in both conditions obtained at the pretest, posttest, and follow-up assessments in Experiment 2**

<table>
<thead>
<tr>
<th></th>
<th>Condition (n = 55)</th>
<th>Control (n = 51)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SPCC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>19.6 (3.1)</td>
<td>20.0 (3.0)</td>
</tr>
<tr>
<td>Post</td>
<td>19.8 (3.2)</td>
<td>20.0 (3.2)</td>
</tr>
<tr>
<td>Fu</td>
<td>20.0 (3.8)</td>
<td>20.1 (3.1)</td>
</tr>
<tr>
<td><strong>IAT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>0.39 (0.33)</td>
<td>0.44 (0.40)</td>
</tr>
<tr>
<td>Post</td>
<td>0.58 (0.26)</td>
<td>0.60 (0.34)</td>
</tr>
<tr>
<td>Fu</td>
<td>0.59 (0.31)</td>
<td>0.63 (0.28)</td>
</tr>
<tr>
<td><strong>NLPT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>0.62 (0.62)</td>
<td>0.61 (0.74)</td>
</tr>
<tr>
<td>Post</td>
<td>0.82 (0.68)</td>
<td>0.76 (0.74)</td>
</tr>
<tr>
<td>Fu</td>
<td>0.80 (0.70)</td>
<td>0.72 (0.74)</td>
</tr>
<tr>
<td><strong>AQY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>11.4 (7.6)</td>
<td>12.1 (8.0)</td>
</tr>
<tr>
<td>Post</td>
<td>12.3 (8.8)</td>
<td>14.0 (8.6)</td>
</tr>
<tr>
<td>Fu</td>
<td>12.4 (9.0)</td>
<td>13.0 (8.0)</td>
</tr>
</tbody>
</table>
Aggression
The AQY scores were analysed by means of a four-way 2 (Condition: experimental vs. control) x 2 (Gender: girls vs. boys) x 2 (Subscale: reactive vs. proactive) x 3 (Assessment: pretest, posttest, follow-up) ANOVA, with the last two factors being repeated measures. As indicated by a significant main effect of Subscale, participants scored higher on the reactive ($M = 10.6, SD = 6.4$) than on the proactive subscale ($M = 1.9, SD = 2.5$). $F(2, 100) = 3.2, p < .05$, partial $\eta^2 = .06$. The main effect of Gender emerged, $F(1, 101) = 10.4, p < .01$, partial $\eta^2 = .09$. This main effect was qualified by a significant Gender x Subscale interaction, $F(1, 101) = 7.5, p < .01$, partial $\eta^2 = .07$, indicating that on the reactive subscale girls ($M = 2.2, SD = 2.8$) scored higher than boys ($M = 12.3, SD = 6.5$). Within-subject contrasts showed that children reported an increase in aggression from the pretest to the posttest ($M = 11.7, SD = 7.8$, and $M = 13.1, SD = 8.8$, respectively), $F(1, 101) = 6.4, p < .05$, partial $\eta^2 = .06$. The difference between the posttest and follow-up assessment ($M = 12.8, SD = 8.4$) was not statistically significant, $F(1, 101) < 1$. In addition, a significant main effect of Gender emerged, $F(1, 101) = 10.4, p < .01$, partial $\eta^2 = .09$. This main effect was qualified by a significant Subscale x Gender interaction, $F(1, 101) = 7.5, p < .01$, partial $\eta^2 = .07$, indicating that on the reactive subscale boys ($M = 12.3, SD = 6.5$) scored higher than girls ($M = 2.2, SD = 2.8$), while no such difference emerged on the proactive subscale. None of the other main or interaction effects reached significance.

Relation between implicit and explicit self-esteem
Unexpectedly, the IAT and the NLPT showed no significant correlation on either the pretest ($r = .03$), posttest ($r = .07$), or follow-up assessments ($r = .15$). The IAT was also not significantly related to the SPPC at pretest ($r = -.14$) or follow-up ($r = .05$), but showed an unexpected significant negative correlation with the SPPC at the posttest assessment ($r = -.24, p < .05$). The NLPT was neither significantly related to the SPPC at pretest ($r = -.02$) or follow-up ($r = .05$), but showed a weak negative correlation with the SPPC at posttest ($r = -.17, p = .09$).

Relation between self-esteem and aggression
There were no significant relations at the pretest, posttest or follow-up assessments between the AQY reactive subscale and the IAT ($r$’s being .06, .04, and .04, respectively), the NLPT ($r$’s being -.09, -.05, and .06, respectively), or the SPPC ($r$’s being -.05, -.02, and -.04, respectively). There were also no significant relations at the pretest, posttest or follow-up assessments between the AQY proactive subscale and the IAT ($r$’s being .08, .04, and -.06, respectively), and the SPPC ($r$’s being -.01, -.09, and -.01, respectively). The relation between the NLPT and the AQY proactive subscale was inconsistent: At pretest the relation was significantly negative ($r = -.24, p < .05$), at posttest it was not significant ($r = .01$), while at follow-up it was marginally significantly positive ($r = .17, p = .09$).

Experiment 3
Method
Participants
A total of 151 primary school children (66 boys, 85 girls) and their parents consented to participate. Children were aged between 9 and 13 years ($M = 11.1, SD = 0.72$). There were no differences regarding gender, $\chi^2(1, N = 151) < 1$, and age, $t(149) < 1$, between the experimental and the control condition.

Materials
Explicit self-esteem. Similar to Experiment 2 the global self-esteem subscale of the SPPC was used as an index of explicit self-esteem. The internal consistency of this scale was good with alphas of .78, .84, and .90 at the pretest, posttest and follow-up assessments respectively. Test-retest stability in the control group was high from pretest to posttest ($r = .79, p < .01$) and from posttest to follow-up ($r = .82, p < .01$).

Implicit self-esteem. To assess implicit self-esteem we employed an IAT and an NLPT for which procedures were identical to Experiment 2. Spearman-Brown corrected split-half reliability of the IAT varied across the pretest, posttest and follow-up assessments ($r$’s being .68, .48, and .35, respectively). Test-retest correlations in the control group were significant both from pretest to posttest, $r = .26, p < .05$, and from posttest to follow-up, $r = .44, p < .01$. For various reasons (e.g., technical problems, illness, school obligations) data of one or more IAT assessments were missing for 17 children (eight in the experimental and nine in the control group). In addition, data of children who made more than 25% errors or who were more than 3 standard deviations removed from the group mean were excluded from the analysis. All in all, the final N for the analysis was 106 (53 in each group).

The NLPT effect was calculated in the same way as in Experiment 2. Data on one or more NLPT assessments were missing for seven children (four in the experimental and three in the control group). In addition, data that were more than 3 standard deviations removed from the group mean were excluded (at follow-up one boy in the control and one boy in the experimental group). The final N for the data analysis of this test was 136 (71 in the experimental and 65 in the control condition). Test-retest correlations in the control group were significant both from pretest to posttest, $r = .43, p < .01$, and from posttest to follow-up, $r = .40, p < .01$. Correlations between the name letter effects for
the first and last name were low but significant for the pretest \( (r = .18, p < .05) \) and the follow-up \( (r = .27, p < .01) \), but not significant for the posttest \( (r = .13, p > .16) \).

**Psychological functioning.** To assess general psychological functioning we employed the Strengths and Difficulties Questionnaire (SDQ; Goodman, 2001). To optimise reliability of the assessments we asked children as well as their parents to fill in this questionnaire, employing the child as well as the parent version of the SDQ. The SDQ is a 25-item self-report measure covering the most important domains of child psychopathology as well as personal strengths. The items describe positive or negative attributes of children and adolescents that have to be scored on a three-point scale (0 = ‘not true’, 1 = ‘somewhat true’, 2 = ‘certainly true’). The items can be allocated to five subscales of five items each pertaining to emotional symptoms, conduct problems, hyperactivity-inattention, peer problems, and prosocial behaviour. In the present study, however, we only used the total difficulties score, which is obtained by summing the scores on all scales with the exception of the prosocial behavior subscale (range 0-40). The psychometric properties of Dutch version of the SDQ are satisfactory (Muris, Meesters, & Van den Berg, 2003b). Missing SDQ data were imputed according to the corrected item mean substitution procedure as proposed by Huisman (1999). The parent reports of two children in the control group (one at the pretest assessment and one at the follow-up assessment) were excluded because there were more than two missing answers. The internal consistency of the SDQ total difficulties score in the present sample was good with alphas of .77 and .79 at the pretest assessment and .79 and .78 at the follow-up assessment, for the child and parent version respectively. Test-retest stability in the control group was high, and this appeared true for the self-report \( (r = .82, p < .01) \) and the parent-report versions of the scale \( (r = .73, p < .01) \).

**Conditioning procedure.** The conditioning task was identical to the one used in Experiments 1 and 2.

**Procedure**

Similar to Experiment 2 all children were tested in small groups with a maximum of four children in a separate room at school. During all assessments children first received a brief introduction and then consecutively completed the IAT, NLPT, and SPPC. Children completed the first SDQ during the pretest assessment. Immediately after completing the pretest assessment participants completed the conditioning procedure for the first time. After one week children completed the conditioning procedure for the second time. After another week children completed the conditioning procedure for the third and final time, immediately followed by the posttest assessment. One month later the experimenter returned for the follow-up assessment, during which children also completed the SDQ for the second time. Parents had received the first SDQ in combination with the informed consent form prior to the start of the experiment and returned it in a closed envelope to the experimenter. They received the second SDQ via their children and were asked to return the completed SDQ when their children received the follow-up assessment.

**Results**

Descriptive statistics for children in both conditions at various assessments are shown in Table 3.

**Table 3.** Mean scores (standard deviations) on various measures of self-esteem and psychological functioning in both conditions obtained at the pretest, posttest, and follow-up assessments in Experiment 3

<table>
<thead>
<tr>
<th>Measure</th>
<th>Condition</th>
<th>Pre</th>
<th>Post</th>
<th>Fu</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experimental</td>
<td>19.6 (2.6)</td>
<td>19.3 (3.1)</td>
<td>19.3 (3.1)</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>19.3 (2.9)</td>
<td>19.3 (3.0)</td>
<td>19.5 (3.7)</td>
</tr>
<tr>
<td>SPPC</td>
<td>Pre</td>
<td>0.38 (0.42)</td>
<td>0.57 (0.37)</td>
<td>0.66 (0.27)</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>0.55 (0.32)</td>
<td>0.60 (0.36)</td>
<td>0.66 (0.27)</td>
</tr>
<tr>
<td></td>
<td>Fu</td>
<td>0.55 (0.35)</td>
<td>0.60 (0.36)</td>
<td>0.66 (0.27)</td>
</tr>
<tr>
<td>IAT</td>
<td>Pre</td>
<td>0.84 (0.75)</td>
<td>0.83 (0.69)</td>
<td>0.74 (0.74)</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>0.78 (0.76)</td>
<td>0.71 (0.79)</td>
<td>0.74 (0.74)</td>
</tr>
<tr>
<td></td>
<td>Fu</td>
<td>0.71 (0.79)</td>
<td>0.74 (0.74)</td>
<td>0.74 (0.74)</td>
</tr>
<tr>
<td>NLPT</td>
<td>Pre</td>
<td>7.7 (5.2)</td>
<td>9.0 (5.4)</td>
<td>7.5 (5.0)</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>6.8 (4.9)</td>
<td>7.5 (5.0)</td>
<td>7.5 (5.0)</td>
</tr>
<tr>
<td>SDQ-C</td>
<td>Pre</td>
<td>5.1 (3.7)</td>
<td>5.7 (4.8)</td>
<td>5.1 (4.2)</td>
</tr>
<tr>
<td></td>
<td>Post</td>
<td>4.2 (3.9)</td>
<td>5.7 (4.8)</td>
<td>5.1 (4.2)</td>
</tr>
</tbody>
</table>

SPPC = Self Perception Profile for Children; IAT = Implicit Association Test (positive scores indicate positive self-esteem); NLPT = Name Letter Preference Task (positive scores indicate positive self-esteem); SDQ-C/P = Strengths and Difficulties Questionnaire, Child and Parent version, respectively; FU = follow-up. N’s vary across variables and assessments due to missing and/or excluded data; reported means are based on the data included in the analyses.

**Explicit self-esteem**

A 2 (Condition) x 2 (Gender) x 3 (Assessment) ANOVA on children’s SPPC scores showed that none of the main or interaction effects was significant (all Fs < 2.0, p > .13). Thus, SPPC scores remained stable over the three assessments, and were independent of Condition and Gender.
**Implicit self-esteem**

IAT. Children’s IAT scores were subjected to a 2 (Condition: experimental vs. control) x 2 (Gender: girls vs. boys) x 3 (Assessment: pretest, posttest, follow-up) ANOVA, with the last factor being a repeated measure. The analysis showed a significant main effect of Assessment, $F(2, 101) = 3.8, p < .05$, partial $\eta^2 = .07$. Within-subject contrasts showed that the difference between the pretest ($M = .47, SD = .40$) and posttest ($M = .58, SD = .34$) assessment was significant, $F(1, 102) = 5.6, p < .05$, partial $\eta^2 = .04$, whereas the difference between the posttest and the follow-up ($M = .61, SD = .32$) assessment was not, $F(1, 100) < 1$. In addition, a significant main effect of Condition emerged, $F(1, 102) = 4.6, p < .05$, partial $\eta^2 = .04$: children in the control condition generally showed higher IAT scores than children in the experimental condition. Finally, a marginally significant main effect of Gender emerged, $F(1, 102) = 3.7, p = .095$, partial $\eta^2 = .04$, indicating that boys tended to have higher IAT scores than girls. None of the other main or interaction effects reached the conventional level of significance (all $F$s < 2.0, $p > .15$).

NLPT. A 2 (Condition) x 2 (Gender) x 3 (Assessment) ANOVA on the NLPT effects revealed that none of the main or interaction effects were significant (all $F$s < 2.3, $p > .1$), indicating that the NLPT effect did not change significantly over the three assessments, and was independent of Condition and Gender.

**Psychological functioning**

To assess changes in general psychological functioning, SDQ total difficulties scores of the children and their parents obtained during the pretest and follow-up assessment were subjected to two separate 2 (Condition: experimental vs. control) x 2 (Gender: girls vs. boys) x 2 (Assessment: pretest vs. follow-up) ANOVAs, with repeated measures on the last factor. Analysis of the child data showed a significant main effect of Assessment, $F(1, 140) = 24.4, p < .01$, partial $\eta^2 = .15$, indicating a decline in SDQ total difficulties scores from the pretest to the follow-up assessment. In addition, a significant main effect of Gender emerged, $F(1, 140) = 5.6, p < .05$, partial $\eta^2 = .04$: the SDQ total difficulties score of girls was lower than that of boys. Analysis of the parent data only yielded a significant main effect of Assessment, $F(1, 116) = 5.1, p < .05$, partial $\eta^2 = .04$, indicating a decline in the SDQ total difficulties scores from the pretest to the follow-up assessment.

**Relation between implicit and explicit self-esteem**

In line with the previous experiment, the IAT and the NLPT showed no significant correlation on either the pretest ($r = .11$), posttest ($r = .02$), or follow-up assessments ($r = .12$). The IAT was also not significantly related to the SPPC at pretest ($r = .09$), posttest ($r = -.01$), or follow-up ($r = .01$). In a similar vein, the NLPT was not significantly related to the SPPC at any of the assessments ($r’s$ being -.03, -.11, and -.04, respectively).

**Relation between self-esteem and psychological functioning**

Higher scores on the SDQ, reflecting higher levels of difficulties, were associated with lower levels of self-reported self-esteem on the SPPC. This was true for parent as well as self-reported difficulties at the pretest ($r’s$ being -.29, $p < .01$, and -.44, $p < .01$, respectively) and the follow-up assessment ($r’s$ being -.20, $p < .01$, and -.41, $p < .01$, respectively). No significant correlations emerged on any of the assessments between either parent or self-reported difficulties and the implicit self-esteem measures, with the exception of a weak relation between self-reported difficulties and the IAT score at pretest ($r = .18, p < .05$) suggesting that higher IAT scores were related to more self-reported difficulties.

**Discussion**

The main results of Experiments 2 and 3 can be summarised as follows. First, no specific enhancement effect of the experimental conditioning procedure emerged. That is, in Experiments 2 and 3 children in the experimental and control condition showed a similar increase in implicit self-esteem from the pretest to the posttest as indicated by the IAT. In addition, in Experiment 2 but not Experiment 3, a similar pattern of results emerged for implicit self-esteem as indicated by the NLPT. Second, in both experiments explicit self-esteem as measured by the SPPC did not change as a result of the experimental manipulation. Third, in contrast with predictions, self-reported aggression as indicated by the AQY increased from the pretest to the posttest assessment. Finally, in Experiment 2 various measures of self-esteem and aggression showed no meaningful correlations with each other. In Experiment 3, explicit but not implicit self-esteem was significantly related to psychological functioning.

Although implicit self-esteem did show an increase from the pretest to the posttest assessment on both the IAT and the NLPT in Experiment 2 and on the IAT in Experiment 3, this increase was independent of the experimental condition. One possible explanation might be that the additional attention that participants received during the experiments was enough to increase implicit self-esteem for all children. The picture is not entirely consistent though, as in Experiment
the NLPT remained stable from the pretest to the posttest assessment. Nevertheless, it seems safe to conclude that any changes in implicit self-esteem were not specifically due to the pairing of self-relevant stimuli with smiling faces. Moreover, completing the conditioning procedure repeatedly did not seem to have any additional enhancement effects as compared with completing the procedure only once. The findings of Experiments 2 and 3 are also informative with respect to the potential correlates of (implicit) self-esteem in children. In Experiment 2 no meaningful relations were found between a self-report measure of aggression and measures of implicit and explicit self-esteem. This finding casts serious doubt on the idea that self-esteem is related to aggression in this age group. In addition, Experiment 3 showed that explicit self-esteem but not implicit self-esteem was related to both child and parent reports of children’s psychosocial difficulties. Possible implications of these findings will be discussed in the general discussion.

**General discussion**

The major purpose of the present experiments was to take a first step in filling the gap in our knowledge concerning implicit self-esteem in children. In a series of three experiments we explored the malleability of self-esteem using the conditioning paradigm of Baccus and colleagues (2004), the relation between measures of implicit and explicit self-esteem, and their relation with measures of aggression and general psychological functioning in various samples of primary school children. A summary of the major findings of these experiments is presented in Table 4, and will be discussed below.

**Effect of conditioning on implicit and explicit self-esteem**

Although the results of Experiment 1 tentatively indicated that the conditioning procedure might be able to enhance children’s implicit self-esteem, and additionally seemed to have an effect on aggression, these findings could not be replicated in Experiments 2 and 3. Note in passing that in two other unreported experiments, which were identical to Experiment 1 with the exception that in one experiment child faces and in the other smiley’s were used instead of adult faces in the condition task, no effects of the conditioning procedure were found either. This strongly suggests that the pairing of self-relevant information with smiling faces has no specific effect on children’s implicit or explicit self-esteem, and that the trend towards group differences found in Experiment 1 either reflects a spurious finding or possibly was the result of pre-existing differences between the experimental and the control group. This raises the question why the currently used experimental conditioning procedure was not able to enhance implicit self-esteem in children, while it was successfully employed for this purpose in a sample of adults (Baccus et al., 2004). There are a number

### Table 4: Summary of main results of Experiments 1-3

<table>
<thead>
<tr>
<th>Exp</th>
<th>ΔISE</th>
<th>ΔESE</th>
<th>rI-E SE</th>
<th>SE-Aggression / SDQ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RSES SPPC SPCP IAT</td>
</tr>
<tr>
<td>1</td>
<td>.005 [n = 131]</td>
<td>.023 [n = 125]</td>
<td>-13 .06</td>
<td>-.08 .04</td>
</tr>
<tr>
<td>2</td>
<td>.002 [n = 86]</td>
<td>.012 [n = 104]</td>
<td>Pre -.14 -.01 Pre -.04 .08 -.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post -.24* .17*</td>
<td>Post -.05 .05 -.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FU .05</td>
<td>.05</td>
<td>FU -.04 .02 -.11</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>.009 [n = 106]</td>
<td>.009 [n = 140]</td>
<td>Pre .09 -.03 Pre&lt;br&gt;min -.44** .18* .07</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post -.01 -.11</td>
<td>Post&lt;br&gt;min -.29* -.16* -.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FU .01</td>
<td>-.04</td>
<td>FU&lt;br&gt;min -.41** .12 .06</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FU&lt;br&gt;min -.20* -.16 .05</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Δ = effect sizes (partial eta²) for posttest differences [Exp. 1] changes in implicit self-esteem (ISE) or explicit self-esteem (ESE) [Exp. 2, 3]; rI-E SE = correlations between implicit and explicit self-esteem measures; rSE-Aggression/SDQ = correlations between implicit and explicit self-esteem measures and the Aggression measure [Hot Sauce test in Exp. 1, and the total score of the Aggression Questionnaire for Youths in Exp. 2] or the Strength and Difficulties Questionnaire [Exp. 3]; RSES = Rosenberg Self-Esteem Scale; SPPC = Self-Perception Profile for Children; IAT = Implicit Association Test; NLPT = Name-Letter Preference Task; min = child report; FU = follow-up; pa = parent report; * p ≤ .1; ** p < .05; *** p < .01; † In unexpected direction; ‡ Based on Time x Group contrast for pretest to posttest.
of possible explanations for these differential results. First, the lack of effects may be the result of the adaptations we made to the procedure. As mentioned earlier, in the Baccus et al. study self-relevant stimuli were always followed by smiling faces, while other-relevant stimuli were always followed by negative or neutral faces. It is unclear whether the reported effects by Baccus et al. were due to a strengthening of positive associations with the self, a strengthening of negative associations with others, or a combination of both. To make sure that any effects would be caused by a strengthening of positive associations with the self we adjusted the procedure so that other-relevant stimuli were equally often followed by positive, negative or neutral faces. However, as a result of this adaptation the contrast between self and other-relevant stimuli is less sharp which may have reduced the effects of the procedure. If true, the results suggest that the effects found by Baccus et al. were mainly caused by a strengthening of negative associations with other, as the data seem to indicate that this procedure is not effective in strengthening positive associations with the self (i.e., increase self-esteem).

Another explanation is that any effects of the experimental conditioning procedure were overshadowed by a more general positive effect of an aspecific factor such as increased attention during the experiment. It may well be that such a factor has quite some influence on children, whereas it may have little impact on adults. In line with such an explanation, the results of Experiments 2 and 3 showed that implicit self-esteem was enhanced for all children, independent of the type of conditioning procedure they completed (i.e., experimental or control). Importantly, the pattern of IAT results suggests that this enhancement of implicit self-esteem cannot simply be attributed to, for instance, test-retest effects. That is, with repeated practice participants learn to overcome the crucial interference during the various phases of the IAT. As a result, test-retest effects on the IAT generally lead to smaller effects. In the present experiments, however, the IAT effects became larger over time. This result was consistent over Experiments 2 and 3, suggesting that it did not reflect a spurious finding. If the effect of the experimental procedure was indeed overshadowed by other factors, conditioning, at least in children, does not seem to be a very efficient way of increasing implicit self-esteem. Related to this, the implicit self-esteem of children in this age group seemed to be fairly positive so that it may be difficult to achieve strong enhancement effects due to a ceiling effect. Adolescents and adults, in contrast, may have been more exposed to (negative) experiences which result in greater variation of implicit self-esteem. Such an explanation would be in line with the idea that middle childhood is a relatively stable period just before the turbulent stage of adolescence, during which self-esteem typically decreases (e.g., Robins et al., 2002). If this line of reasoning is correct, then it would be interesting to explore at what age the implicit self-esteem of children/adolescents starts to change. In addition, it might be interesting to see whether the implicit self-esteem of a preselected sample of ‘at risk’ children or children with current psychopathology that are likely to display relatively low levels of implicit self-esteem can be increased using the evaluative conditioning procedure.

While implicit self-esteem seemed to be affected similarly by the experimental and control conditioning procedures in Experiments 2 and 3, there was no effect of the conditioning procedure on explicit self-esteem in any of the experiments, which is in line with previous findings in adults (Baccus et al., 2004). One explanation for the differential effects on implicit and explicit self-esteem might be that measures of implicit self-esteem are more sensitive to temporal changes in self-evaluative associations than a self-report measure like the SPPC. That is, the SPPC subscale used in all experiments asks children how they generally evaluate themselves, rather than how they view themselves at that very moment. For implicit measures, on the other hand, it is known that they are at least partly context dependent (see for instance Blair, 2002 for a review). Following this, the implicit measures may have been more influenced by any additional positive reinforcement and attention that the children received while participating in the experiment than the SPPC.

For exploratory reasons the factor gender was included in all experiments. No gender differences were found with respect to implicit self-esteem in any of the experiments. Thus, although gender role and stereotypes develop early in childhood such differences apparently do not (yet) differentially influence implicit self-esteem in primary school children. Although previous studies indicate that there appears to be a small but consistent gender difference in explicit self-esteem, with males showing higher self-esteem than females (e.g., Kling, et al., 1999; Veerman et al., 1997), such a pattern did not emerge consistently in the present experiments. Meanwhile, mean scores of boys were higher than those of girls.
Relation between measures of implicit and explicit self-esteem

No consistent meaningful relations emerged between the implicit and explicit self-esteem measures. In the adult self-esteem literature meta-analyses found weak but positive mean population estimates for the relation between self-report measures and the IAT (e.g., Hoffman et al., 2005) and the NLPT (Krizan & Suls, 2008). One factor that may have suppressed the correlations in the present experiments is that the IAT always preceded the self-reports (cf. Hoffman et al., 2005; Krizan & Suls, 2008). It seems a consistent finding, however, that the relation between implicit and explicit measures of self-esteem is not strong, neither in children nor in adults. It is not clear what to make of this finding. Some authors interpret this finding as support for the idea that both types of measures reflect different underlying constructs (e.g., Baccus et al., 2004; Franck et al., 2007). Other authors, however, argue that implicit and explicit self-esteem measures tap the same underlying construct and contend that the observed low correlations are due to a lack of reliability of implicit self-esteem measures (e.g., Dijksterhuis et al., 2007). Although the present series of experiments were not designed to address this fundamental issue, it is clear that the reliability of the currently used measures of implicit self-esteem deserves some discussion. For the IAT split-half reliabilities were on average $r = .63$ at the first assessment but lower at subsequent assessments at one week and one month follow-up (around $r < .44$ for the second and third assessment over two experiments). Although these numbers are somewhat lower than what has been reported for adult samples they are still a lot higher than those reported for the NLPT in children (e.g., Nosek, Greenwald, & Banaji, 2007). The same is true for the test-retest reliabilities (Bosson, Swann, & Pennebaker, 2000; Nosek et al., 2007). One explanation for the lower reliabilities in these child populations may be that children find the task more difficult than adults, for instance due to a shorter attention span. However, over the first three experiments approximately 4% of the children made more than 25% errors, suggesting that the task was not too difficult. All in all, compared with other latency based measures in adults this version of the IAT performed pretty well. The same cannot be said about the NLPT for which correlations between effects based on the initials of the first and last name ranged between .00 and .27, with a mean correlation of .12. This extremely poor internal consistency limits the maximally possible correlation with other measures to such an extent that significant correlations can hardly be expected. In contrast, the NLPT seems to have a modest degree of internal consistency in adults (see Bosson et al., 2000). This suggests that the NLPT is not an appropriate test for children in this age range, possibly because children have had much less exposure to their name letters than adults.

Relation between self-esteem and aggression / psychological functioning

The current findings seem to suggest that we can exclude aggression and general psychological functioning from the list of potentially relevant correlates of implicit self-esteem in children. However, similar to what has been mentioned above, the observed low correlations with the NLPT are certainly due to the very poor reliability of this measure, and also correlations with the IAT may have been suppressed due to limited reliability. In addition, the present experiments included unselected samples that predominantly consisted of healthy functioning children. In line with this, implicit self-esteem was generally rather positive, while (self-reported) aggression and difficulties were fairly low. Therefore, it remains possible that significant relations between implicit self-esteem and aggression and other psychological difficulties can be found for instance in samples of children with conduct or psychological disorders. In addition, it also remains possible that implicit self-esteem plays a more prominent role in psychological functioning in children at an older age.

Explicit self-esteem on the other hand was clearly related to general psychological functioning, such that lower levels of self-reported self-esteem were associated with higher levels of difficulties as reported by the children themselves as well as their parents. This finding is in line with other studies that have observed a relation between low explicit self-esteem and a range of negative consequences (e.g., Bos et al., 2006; Harter, 1993; Muris et al., 2003a; Muris et al., 2005). The relation between explicit self-esteem and the aggression measures was low but consistently negative. The direction of this relation is in line with adult studies suggesting that lower levels of self-esteem are associated with higher levels of aggression (Donnellan et al., 2005).

Issues for future research

So what can we learn from these studies? With respect to the question whether pairing of self-relevant information with smiling faces can lead to increases in self-esteem, the present experiments suggest that this is not the case. Given that the effect sizes were very small at best, the lack of effects does not seem to reflect a simple power problem. Furthermore, even though the reliability
of the implicit measures was certainly not high, the reliability of the IAT was much better than has been reported for other implicit measures in adult samples, and hence should be high enough to detect meaningful group differences. Thus, the conditioning procedure did not seem to work as expected. Meanwhile, the possibility cannot be ruled out that this result was due to the use of this specific experimental procedure. Perhaps alternative procedures, such as the subliminal conditioning procedure that was successfully used by Dijksterhuis (2004) to enhance implicit self-esteem in students, may be more successful. Although we cannot think of any a priori reason why another evaluative conditioning procedure would be more effective, this remains a potential lead for further research.

With respect to children’s implicit self-esteem it is clear that a lot of work remains to be done. As a first step to explore children’s implicit self-esteem it seemed logical to employ measures that have been successfully employed in adults, and this seemed particularly true for the IAT as this procedure has been successfully employed in earlier studies of children (e.g., Baron & Banaji, 2006; Field & Lawson, 2003). From this first exploration of implicit self-esteem in children it has become clear, however, that a major challenge for researchers will be to improve the measures in terms of reliability and validity. We hope that the present findings will be a useful starting point for finding ways to improve measures of implicit self-esteem in children.

Another area where a lot of exciting questions await future research concerns the origins and development of implicit self-esteem. Although the current findings tentatively suggest that implicit self-esteem is generally positive in middle childhood, there are data that suggest that the origins of adult implicit self-esteem lie in youth. DeHart, Pelham, & Tennen (2006) found that college students’ as well as their mother’s retrospective reports of the parenting style, were related to current levels of implicit self-esteem. A challenge for future research would be to further explore this issue adopting a more developmental approach, for instance by longitudinal studies in which the development of children’s implicit and explicit self-esteem is monitored and the relation with symptoms of current and later psychopathology can be explored.

Taken together, this first exploration of implicit self-esteem in children reveals a lot of questions and challenges for researchers in this field. Nevertheless we feel safe to conclude that, apparently, most children between the ages of 10 and 13, do not need an additional smile to make them feel worthwhile.

References


How do children experience their parents’ feeding practices?

A study using the Dutch Child Feeding Questionnaire- child version

Aim: The Child Feeding Questionnaire (CFQ) is a self-report instrument that assesses the amount of parental control over child feeding. It is usually completed by parents but social desirability, feelings of shame, and inadequate introspection or self-perception may cloud parents’ self-reports. Children’s experiences of parental control could be quite different from their parents’ reports. In the current study it was considered how school-age children (8-12 years) perceive parental feeding control. In particular, the role of overweight and the correspondence between perceptions of children and their parents were examined.

Methods: A child version of the CFQ was constructed and the relationship between weight status and the experienced parental control was investigated. It was hypothesised that overweight children and children of overweight parents experience more control over child feeding than do normal-weight children and children of normal-weight parents. Moreover, the correspondence between parents’ reports and children’s experiences of parental control was examined.

Results: Weight status of neither the child, nor the parent played an important role in perceived child feeding control; no differences were found with respect to attitudes and practices. Regarding parent-child differences, children’s perceptions differed from their parents’ reports of control with respect to two out of six subscales. Weight status of the child did not influence the agreement between parent and child scores.

Conclusions: As parents and children correspond well on the Child Feeding Questionnaire, the child version of this questionnaire should be further examined in order to determine its validity.


Received 20 March 2009; accepted 25 November 2009

Keywords: Parental control; Child Feeding Questionnaire; Overweight

Authors: Esther Jansen, Sandra Mulkens, Ellen Sanders and Anita Jansen
Obesity is considered one of the most serious threats to public health. In the United States, one in three adults is obese (body mass index (BMI) > 30 kg/m²) (Ogden, Carroll, Curtin, McDowell, Tabak, & Flegal, 2006). Among children, the prevalence of overweight is increasing as well. In the United States, about 17% of all children and adolescents are overweight, whereas an additional 16.5% are at risk of becoming overweight (Ogden et al., 2006). As childhood overweight and obesity often track into adulthood (Whitaker, Wright, Pepe, Seidel, & Dietz, 1997; Clarke & Lauer, 1993; Serdula, Ivery, Coates, Friedman, Williamson, & Byers, 1993), it is of great significance to challenge this health risk at a young age. Parents are believed to have a substantial influence when it comes to the development of their children’s weight status (Birch & Fischer, 1995). Besides acting as role models, being responsible for purchases and providing meals, parents may also influence their children’s food preferences and intake by using control techniques. Parental control in the domain of eating can be subdivided into pressuring the child to eat healthy kinds of food and restricting the intake of unhealthy, palatable kinds of food (Birch, Fisher, Mackey, Grimm-Thomas, Sawyer, & Johnson, 2001). Nevertheless, overcontrolling children’s intake might have adverse effects on food preferences and consumption. It has been hypothesised that parents who overcontrol their children’s food intake may interfere with their children’s ability to self-regulate intake. As a result, children would become more responsive to external cues (e.g. the smell and presence of food) as opposed to internal cues (e.g. hunger and satiety) (Faith, Scanlon, Birch, Francis, & Sherry, 2004; Jansen, Theunissen, Slechten, Nederkoorn, Mulkins, & Roefs, 2003). This could lead to disturbed eating behaviours such as eating in the absence of hunger, restrained eating and eventually excessive weight gain (Birch & Fisher, 2000; Birch, Fisher, & Krahnstoever Davison, 2003; Robinson, Kiernan, Matheson, & Hailed, 2001). According to the ‘obesity proneness’ model (Constanzo & Woody, 1985), parents are likely to exert more control when they experience weight issues themselves or when they think their children are at risk for developing eating problems or overweight. So far, causal evidence for adverse effects of parental control is scarce. However, completely in line with the obesity proneness model, earlier research has found parental control in child feeding, as measured by the Child Feeding Questionnaire (CFQ; Birch et al., 2001), to be correlated with children’s weight status: a higher level of reported control was associated with a higher BMI (Birch et al., 2003). The CFQ is a valid and widely used measure of parental beliefs and practices regarding child feeding (Kaur, et al., 2006; Keller, Pietrobelli, Johnson, & Faith, 2006). Although CFQ scores and weight status indeed seem to be correlated, it can be questioned whether these CFQ data are reliable. After all, CFQ scores are self-reported. It is unknown whether parents have sufficient insight into their own behaviours to provide dependable answers. In addition, factors such as social desirability and feelings of shame and guilt may be involved when inquiring about child feeding. Further, the perception of parental control by the child itself might be extremely relevant for eating behaviour. Apart from children’s responses being less sensitive to social desirability (Gonzales, Cauce, & Mason, 1996; Paulson, 1994) and feelings of shame and guilt (Tagney, Wagne, Gavlas, & Gramzow, 1991), the perception of experienced control might be a more important determinant of eating behaviour than the actual control or parents’ perceptions of their control. After all, children are expected to act upon how they experience control, not upon parent’s reports of control or the control that is objectively exerted. For the purpose of the current study, a child version of the CFQ was constructed. The first aim of the study was to test the relationship between children’s experiences of parental control and weight status. In line with the obesity proneness model (Constanzo & Woody, 1985), it was hypothesised that overweight children would experience more parental control over child feeding than normal-weight children would. In addition, children of overweight parents were expected to experience more parental control than children of normal-weight parents. A second aim of the current study was to examine to what extent congruence existed between children’s perceptions about parental control over child feeding and their parents’ reports. Good agreement between children’s experiences and parents’ reports was expected. However, it was hypothesised that overweight children and their parents agreed less on parental control than normal-weight participants. This was expected to be the result of the fact that parents of overweight children use ineffective parenting practices such as inconsistent discipline (Decaluwé, Braet, Moens, & Van Vlierberghe, 2006; Johnson, Brownell, St. Jeor, Brunner, & Worby, 1997). For example, higher adaptability (e.g. constantly changing rules) is associated with an early onset of obesity and disturbed eating behaviour. With respect to child feeding, parents might restrict intake at one occasion, but may be permissive at another occasion. As a result, children do not know where they stand, possibly resulting in a discrepancy between parent and child with respect to CFQ scores.
Method

Participants
Ninety-four school-age children (45 boys) participated in this study. The age of the participating children ranged from eight to twelve years (mean age = 9.60, SD = 1.30). Forty-eight children had a normal weight (mean BMI percentile score of 48.49), 46 children were overweight (BMI percentile score > 90; M = 97.40). See also Table 1 for participant characteristics. The overweight participants were recruited from a waiting list for multidisciplinary weight loss treatment in an ambulant setting. The normal-weight participants were recruited from two primary schools in the same community. Their BMI percentile scores had to be between .15 and .85. Response rates for both groups was 100%. The parent who spent the most time with the child (in 87.8% of the cases this was the mother, in 12.2% it was the father) was approached and invited to fill out a questionnaire about her/his child’s feeding behaviour. Their children were requested to fill out the child version of the questionnaire. Permission for participation was obtained from both the Atrium Medical Centre in Heerlen, and the ethics committee of the Faculty of Psychology and Neuroscience, Maastricht University, the Netherlands.

<table>
<thead>
<tr>
<th>Table 1 Participant characteristics: normal-weight versus overweight children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal-weight children (n=48)</td>
</tr>
<tr>
<td>Age (mean (SD))</td>
</tr>
<tr>
<td>Gender (boys/girls)</td>
</tr>
<tr>
<td>Parents with normal weight</td>
</tr>
<tr>
<td>Overweight parents</td>
</tr>
</tbody>
</table>

Measurements
Child Feeding Questionnaire
Parents filled out the CFQ (Birch, et al., 2001). The original version of the CFQ was translated into Dutch with permission of the authors. The CFQ is a measure of parental attitudes, beliefs and practices of child feeding and obesity proneness. It is based on the above-mentioned obesity proneness model (Constanzo & Woody, 1985). The CFQ comprises 31 items on seven subscales. These seven subscales can be classified into two categories. The category ‘risk factors and concerns’ includes the subscales ‘perceived feeding responsibility’, ‘perceived parent overweight’ (how parent classifies own weight), ‘perceived child overweight’ (how parent classifies child’s weight) and ‘concerns about child overweight’. The category ‘control in child feeding: attitudes and practices’ comprises the subscales ‘restriction’, ‘pressure to eat’ and ‘monitoring’ (keeping track of child’s eating behaviour). Every item is scored on a scale from ‘1’ to ‘5’. Subsequently, subscale scores are calculated by averaging the corresponding item scores. The higher the score, the more parental control is exerted. The internal consistency of the seven subscales is good; all subscales have a Cronbach’s alpha above .70. The CFQ has been proven valid in non-Hispanic Whites and Hispanic samples (Birch et al., 2001).

Child Feeding Questionnaire: child version
For the current study, the original CFQ was converted into a child version. All items were rephrased in such a way that the questions were asked from the child’s perspective. For example the original item: ‘I intentionally keep some foods out of my child’s reach’ was rephrased into ‘My parents try to keep some foods out of my reach’. The subscale ‘perceived parent overweight’ was excluded from the child version of the CFQ, since children do not have insight into their parents’ weight history. Considerable effort was put into preventing affection of the tenor of the original questions. See also Appendix A for the modified version of the CFQ. Although the original CFQ is also useful for parents of very young children (from the age of two onwards), the child version is suitable for children with sufficient reading skills. The reliability of the CFQ child version is good, Cronbach’s alphas for the six subscales being .72, .74, .85, .69, .66 and .88 respectively in our sample.

Body mass index
Weight and height of the overweight children and their parents were measured (after completing the CFQ) by a research worker. Weight (kg) was measured by means of a digital scale. Height (cm) was assessed with a measuring tape which was applied to the wall. The research worker had undergone a short training in collecting this kind of information correctly.
Weight and height data of the normal-weight children and their parents were provided by the parents. BMIs and BMI percentiles were calculated subsequently (Children’s BMI-percentile-for-Age Calculator, USDA/ARS Children’s Nutrition Research Center).

Procedure
Parents and children received an original (parent version) or a child version of the CFQ, respectively. The overweight children and their parents received their questionnaires during the interview on admission to the weight loss treatment. They were instructed to individually fill out the questionnaire in situ. The normal-weight participants and their parents received their questionnaires at
school, and were instructed to complete the questionnaires at home, without consultation of the other participating family member. It was stressed that participants should base their answers on their own experiences.

Data analyses
A one-way analysis of variance (ANOVA) on BMI percentile was performed to confirm that the two groups (overweight children versus normal-weight children) actually differed with respect to BMI percentile. In addition, one-way ANOVAs on age and gender distribution were performed to preclude group differences at the start of the study. To test whether the weight status of the children influenced their experiences of parental control (Hypothesis 1), and whether weight status of the parent influenced their children’s experiences of parental control (Hypothesis 2), a multivariate analysis of variance (MANOVA) (child CFQ subscale scores as dependent variables, both child’s weight status and parental weight status as factors) was carried out. Both factors were entered into one analysis to examine possible interaction effects of child weight status and parental BMI on CFQ scores. Finally, to test agreement between the children and their parents (Hypothesis 3), a repeated measure design with parent CFQ scores at Time 1, child CFQ scores at Time 2, and weight status of the child as between-subjects factor was carried out for every subscale of the CFQ.

Results
One-way ANOVA showed that the overweight children had significantly higher BMI percentiles than the normal-weight children \( F = 128.39, p < .001 \). In addition, the group of overweight children did not differ from the group of normal-weight children regarding gender distribution \( F = .16, p = .69 \), but the groups differed with respect to age \( F = 24.01, p < .001 \), the overweight children being slightly older than the normal-weight children (10.20 versus 9.02 years).

Hypotheses 1 and 2
Overweight children perceive more parental control over child feeding than normal-weight children do and children from overweight parents perceive more parental control over child feeding than children from normal-weight parents do. In general, overweight children had higher CFQ total scores than normal-weight children.

In addition, results of the MANOVA showed that overweight children scored significantly higher than normal-weight children with respect to ‘perceived child overweight’ \( F (1, 90) = 38.47, p < .001 \), and ‘concerns about child overweight’ \( F (1, 90) = 40.88, p < .001 \). There were no significant differences on the other four subscales. Parental weight status did not influence perceived parental control scores. With respect to interaction effects, no child weight status X parental weight status effects were found on child CFQ scores. For the significant results, see also Table 2.

Hypothesis 3
In general, parents and children agree well on (perceived) parental control over feeding, but there is more agreement between normal-weight children and their parents than between overweight children and their parents.

As hypothesised, the agreement between children and their parents was good. No differences were found between the parent CFQ total score and child CFQ total score \( F (1,90) = 2.45, p = .12 \). In addition no interaction effects were found between questionnaire version and weight status of the child; that is, overweight children did not differ from normal-weight children in the agreement with their parents scores \( F (1,90) = .047, p = .83 \). With respect to the subscales, significant differences between parent and child scores were found on the subscales ‘perceived feeding responsibility’ and ‘pressure to eat’. Regarding ‘perceived feeding responsibility’, parents score significantly higher than their children do \( F (1,92) = 6.17, p < .05 \). Regarding ‘pressure to eat’, parents score significantly lower than their children do \( F (1,92) = 4.89, p < .01 \). No significant differences were found on the other four subscales. As for any differences in agreement between normal-weight children and overweight children, a significant questionnaire x weight status interaction was found with respect to ‘concerns about child overweight’. Overweight children scored significantly lower than their parents, whereas normal-weight children scored significantly higher than their parents. See also Table 3.

Table 2: Mean (SD) child CFQ total score and subscale scores: normal-weight children versus overweight children

<table>
<thead>
<tr>
<th></th>
<th>Normal-weight children (n=48)</th>
<th>Overweight children (n=43)</th>
<th>F value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived child overweight</td>
<td>2.94 (.32)</td>
<td>3.45 (.33)</td>
<td>38.47</td>
<td>&lt;.001**</td>
</tr>
<tr>
<td>Concerns about child overweight</td>
<td>2.16 (1.20)</td>
<td>3.87 (.89)</td>
<td>40.88</td>
<td>&lt;.001**</td>
</tr>
<tr>
<td>CFQ total score</td>
<td>19.65 (2.40)</td>
<td>21.66 (2.64)</td>
<td>9.16</td>
<td>&lt;.01*</td>
</tr>
</tbody>
</table>

Data presented as mean (SD); * p<.05 ; ** p<.001.
Discussion

The aim of the current study was to investigate how children perceive their parents' control over feeding, and whether child and parent weight status influences perceived control in children. Moreover, the agreement between perceptions of children and their parents was examined. In addition, a possible interaction with weight status of the child was tested. For this purpose, a child version of the CFQ was constructed and administered to 48 normal-weight children, 46 overweight children and their parents. In general, overweight children scored higher on the CFQ than normal-weight children. However, these differences were, for the greater part, found in the subscales 'perceived child overweight' and 'concerns about child overweight'. It seems just plain logic that parents of overweight children are more concerned about their children's weight statuses as opposed to parents of normal-weight children. In fact, when looking at the subscales in the category 'control in child feeding: attitudes and practices', no differences at all were found between the perceptions of overweight and normal-weight children. Therefore, from this study, it cannot be concluded that overweight children experience more control over feeding than normal-weight children. In addition, parental weight status did not influence children's perceptions of parental control. However, in order to draw firmer conclusions about the causal relationship between parental control and overweight, experimental research is badly needed. Future research might focus on manipulating the level of control in normal-weight children, to examine its effects on eating behaviour and weight status. A second aim of the study was to examine the possible differences between parents' reports and children's experiences concerning parental control. In general, children's perceptions correspond well with their parents' reports. Therefore, it might be useful to administer the child version of the CFQ in the future. However, with respect to the subscales 'perceived feeding responsibility' and 'pressure to eat', significant differences were found between child CFQ and parent CFQ scores. Children score lower than their parents do with respect to feeding responsibility, and they score higher than their parents with respect to pressure to eat (they experience more pressure than their parents claim to exert).

Weight status of the child did not influence agreement between child and parent scores as expected. Overweight children were expected to differ more from their parents than normal-weight children. However, no such differences were found. The only interaction effect of child weight status x questionnaire version was found with respect to 'concerns over child overweight'. Overweight children scored lower than their parents, whereas normal-weight children scored higher than their parents. The fact that overweight children score lower than their parents could possibly be explained by social desirability of the parent; when your child is overweight, you must be very concerned.

The question which version of the questionnaire correlates best with actual control behaviour is interesting. More research is necessary to determine whether the original CFQ or the child CFQ is more valid and reliable. Nevertheless, the question remains whether it is really necessary to know objectively to what extent parental control is exerted. It seems more relevant to examine how experienced control and disturbed eating behaviours are related.

A limitation of this study concerns the use of the CFQ. Although the CFQ is a valid and widely used

### Table 3 Differences between child CFQ scores and parent CFQ scores

<table>
<thead>
<tr>
<th></th>
<th>Main effect: differences between parent CFQ scores and child CFQ scores</th>
<th>Interaction effect: questionnaire version x child weight status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F value</td>
<td>P value</td>
</tr>
<tr>
<td>Total CFQ score</td>
<td>2.44</td>
<td>NS</td>
</tr>
<tr>
<td>Feeding responsibility</td>
<td>6.17</td>
<td>&lt;.05*</td>
</tr>
<tr>
<td>Perceived child overweight</td>
<td>.11</td>
<td>NS</td>
</tr>
<tr>
<td>Concerns about child overweight</td>
<td>.87</td>
<td>NS</td>
</tr>
<tr>
<td>Restriction</td>
<td>.008</td>
<td>NS</td>
</tr>
<tr>
<td>Pressure to eat</td>
<td>24.89</td>
<td>&lt;.001**</td>
</tr>
<tr>
<td>Monitoring</td>
<td>.11</td>
<td>NS</td>
</tr>
</tbody>
</table>

Data presented as mean (SD); * p<.05; ** p<.001. NS = not significant.
References


Appendix A

<table>
<thead>
<tr>
<th>Instruction</th>
<th>Please circle one number for each question which best corresponds to your answer.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
</tr>
<tr>
<td>1. When you are at home, how often do your parents feed you?</td>
<td>1</td>
</tr>
<tr>
<td>2. How often do your parents decide how much you eat?</td>
<td>1</td>
</tr>
<tr>
<td>3. How often do your parents decide whether you have eaten the right kind of food?</td>
<td>1</td>
</tr>
</tbody>
</table>
**Instruction** Please indicate how your weight was at each of these 6 periods. Circle only one number for each period.

<table>
<thead>
<tr>
<th></th>
<th>Serious underweight</th>
<th>Underweight</th>
<th>Average</th>
<th>Overweight</th>
<th>Serious overweight</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Instruction** Please circle one number for each question which best corresponds to your answer.

<table>
<thead>
<tr>
<th></th>
<th>Unconcerned</th>
<th>A little bit unconcerned</th>
<th>Neutral</th>
<th>A little bit concerned</th>
<th>Concerned</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Instruction** Please circle one number for each question which best corresponds to your answer.

<table>
<thead>
<tr>
<th></th>
<th>Disagree</th>
<th>Disagree a little bit</th>
<th>Neutral</th>
<th>Agree a little bit</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Instruction** Please circle one number for each question which best corresponds to your answer.

<table>
<thead>
<tr>
<th></th>
<th>Disagree</th>
<th>Disagree a little bit</th>
<th>Neutral</th>
<th>Agree a little bit</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>22.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Instruction** Please circle one number for each question which best corresponds to your answer.

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Most of the time</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
The loss of happy life years associated with mental disorders in the Netherlands

How detrimental are mental disorders? One way to answer that question is to consider the effects on happiness. We analysed a representative sample (N = 7076) of the Dutch population, who were asked how often they had felt happy during the past four weeks. Mental disorders were assessed using the Composite International Diagnostic Interview. It turns out that the lowest levels of happiness are almost the exclusive domain of people with mental disorders. The total loss of happy life years due to mental disorders is 36.6 million for the Netherlands.

Received 9 April 2009; accepted 11 November 2009

Keywords: Anxiety disorders; Happiness; Happy life years; Mental disorders; Mood disorders, Substance abuse disorder

Authors: Ad Bergsma*, Ruut Veenhoven*, Margreet ten Have** and Ron de Graaf**

There are many social problems and the means to meet these are scarce. This calls for priority setting, which requires urgency criteria. In the perspective of utilitarian moral philosophy (Bentham, 1907) priority should be given to the solution of problems that depress happiness most. In that context we explored how much happiness is lost in association with mental disorders in the Netherlands.

Method
We studied who is unhappy in a representative sample (N = 7076) of the Dutch population, in the NEMESIS study (Bijl, Van Zessen, Ravelli, De Rijk, & Langendoen, 1998). The respondents were interviewed using the Composite International Diagnostic Interview (Wittchen et al., 1991) to assess mental disorders. Happiness was measured using a single question on how often respondents had felt happy during the past four weeks. Response options were: never felt happy (1), rarely felt happy (2), sometimes felt happy (3), often felt happy (4), usually felt happy (5), and always felt happy (6). This measure has been shown to be valid for people with mental disorders (Bergsma et al., 2010).

Results
It turned out that 57.7% of the people who never or rarely felt happy during the past four weeks suffered from a mental disorder and an additional 26.9% had a history of a mental disorder. We mention lifetime prevalence because psychopathology is associated with the residual functional disability when a disorder is cured or in remission (Bijl & Ravelli, 2000).

We have calculated for the first time the loss of ‘happy life years’ that is caused by different mental disorders. In this measure life expectancy in years is multiplied by average happiness on a scale of 0 – 1 (Veenhoven, 1996). The average happy life expectancy for people who do not have a history of mental disorder is 63.2 years in the Netherlands. The one-month prevalence of different mental disorders and the associated levels of happiness was used in the calculations of the loss of happy life years for different mental disorders. It was taken into account that unhappiness is associated with a loss of longevity (Lyubomirsky, King, & Diener, 2005, Veenhoven, 2008). The median group that had felt happy sometimes or often was given an average life expectancy. The most happy group (usually or always happy) got an additional 2.5 months of life and the most unhappy group (never or rarely happy) lost five life years. This is roughly what the available research tells us. We did not add an extra loss of life years for the people with addictions, although unhealthy drinking and drugs use can compromise life expectancy.

It is not possible to add up the total loss of happy life years for the different disorders, to get the
This is a fictive person who will suffer from a mental disorder during his or her whole life. In reality the disorders come and go and the burden is spread among more people.

Total sum, because 4.6% of our respondents had more than one mental disorder. It is especially the existence a co-morbid mood disorder that enhances the loss of happy life years of the anxiety and substance abuse disorders.

Conclusion

Not everybody with a mental disorder is unhappy (Bergsma et al., in press), but it is apparent that the loss of happiness associated with mental disorders is enormous. The 36.6 million loss of happy life years is a conservative estimate, because we did not take the residual functional disability into account that is characteristic for people who have a history of mental disorder, but do not meet the criteria for a disorder at the time of measurement. Mental disorders should therefore be regarded as a social problem that deserves priority in public policy. Investment in mental health care is likely to add substantially to greater happiness of a greater number.

References


Table 1 The burden of mental disorders in loss of happy life years for the population of the Netherlands

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Loss in happy life years for one person</th>
<th>% of the population affected</th>
<th>Total loss of happy life years for the Netherlands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any mental disorder during the past month</td>
<td>14.2</td>
<td>15.7</td>
<td>36.6 $10^4$</td>
</tr>
<tr>
<td>Any mood disorder during the past month</td>
<td>31.8</td>
<td>4.0</td>
<td>21.1 $10^4$</td>
</tr>
<tr>
<td>Any anxiety disorder during the past month</td>
<td>14.6</td>
<td>9.8</td>
<td>23.6 $10^4$</td>
</tr>
<tr>
<td>Any substance abuse disorder during the past month</td>
<td>10.1</td>
<td>4.8</td>
<td>7.9 $10^4$</td>
</tr>
</tbody>
</table>
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