Applying the Elaboration Likelihood Model of persuasion to a videotape-based eating disorders primary prevention program for adolescent girls.

Giselle. F. Withers, DPsych

Eleanor H. Wertheim, PhD,

School of Psychological Science, La Trobe University, Bundoora (Melbourne), Vic.

Australia.

Running head: Videotape-based prevention program

Abstract

This study applied principles from the Elaboration Likelihood Model of Persuasion to

the prevention of disordered eating. Early adolescent girls watched either a preventive

videotape only (n=114) or video plus post-video activity (verbal discussion, written exercises,

or control discussion) (n=187); or had no intervention (n=104). Significantly more body

image and knowledge improvements occurred at post and follow-up in the intervention

groups compared to no intervention. There were no outcome differences between intervention

groups, or between girls with high or low elaboration likelihood. Further research is needed in

integrating the videotape into a broader prevention package.

The prevention of eating disorders in adolescence is a complex and difficult task as evidenced by the fact that many prevention studies have had limited success in producing changes in participants (e.g., Baranowski & Heatherington, 2001; Killen et al, 1993; Martz & Bazzini, 1999; Moreno & Thelen, 1993; Neumark-Steiner, Butler & Palti, 1995; Paxton, 1993; Smolak & Levine, 2001; Smolak, Levine, & Schermer, 1998a, 1998b). While recent programs have achieved more promising results, attitude changes have still been small and mostly short-lived (e.g., Heinze et al., 2001; Littleton & Ollendick, 2003; Neumark-Sztainer, Sherwood, Coller & Hannan, 2000; O'Dea & Abraham, 2000; Santonastaso et al., 1999; Stewart, Carter, Drinkwater, Hainsworth, & Fairburn, 2001; Stice, Mazotti, Weibel, & Agras, 2000; Stice, Chase, Stormer, & Appel, 2001; Winzelberg et al, 2000).

Effective prevention programs depend on the program designer's ability to combine a knowledge of eating disorder risk factors with a thorough understanding of behavior change principles. This ability, however, is limited by the quality of information the respective research fields can provide. While an abundance of research has focussed on eating disorder risk factors, few studies have examined the mechanisms of change in associated attitudes and behaviors. Thus, researchers may be close to understanding *what* attitudes to target in their prevention programs, but far from understanding *how* to do it.

Despite over 30 prevention programs now reported in the literature, researchers have made little progress in determining which presenters, what styles of presentation, which types of media, and which content topics are most effective for adolescent girls. Similarly, little is known about personal characteristics of the audience that might interact with the other message components. One of the problems is that programs vary widely in the combinations of message components they employ. Consequently, when evaluating program outcome, researchers have been unable to ascertain which program factors enhanced or inhibited

program success. Furthermore, variations in program components make comparisons *between* program outcomes difficult to interpret, resulting in poor integration of the program findings.

One way to address these limitations is for prevention programs to incorporate a social influence framework to guide program development and standardise evaluation. Within this framework four program components, specifically presenter characteristics, message channel (format), content and receiver characteristics (McGuire, 1968), can be systematically examined and compared so that effective or ineffective components for a given target population can be identified.

The Elaboration Likelihood Model of Persuasion (ELM, Petty & Cacioppo, 1986) is a well-researched social influence framework that we have begun to use to evaluate prevention program components (Withers, Twigg, Wertheim, & Paxton, 2002). The ELM posits that individuals tend to process a persuasive message in one of two ways. Some individuals carefully scrutinize the merits of the arguments presented in the message (high elaboration) and either favour the arguments if they are strong or disfavour the arguments if they are weak. Attitudes formed in this way occur through the 'central route' and are proposed to be longer lasting and predictive of behavior. Alternatively when individuals are not motivated to think through message arguments, they tend to use peripheral cues, such as presenter attractiveness, to evaluate the message (low elaboration). These attitudes are formed though the 'peripheral route' and are considered to be short lasting and less predictive of behavior. Petty and Cacioppo (1986) therefore suggest that more effective persuasion occurs through the central route.

'Central route' attitude change is likely to be dependent on two factors: the individual's *motivation* to elaborate on the persuasive message (receiver characteristics), and his or her *ability* to elaborate (i.e., situational factors such as distraction, message comprehensibility, message repetition). In previous research, we (Withers et al., 2002)

focussed on two receiver characteristics predictive of motivation: need for cognition (i.e., the degree to which an individual engages in and enjoys cognitive activity) and personal relevance (i.e., the level of interest or relevance an issue has to a person). The ELM predicts that people with high need for cognition and personal relevance process messages through the central route and therefore show greater and longer lasting attitude change.

In our previous research (Withers et al., 2002) 104 Grade 7 girls who watched a brief eating disorders prevention videotape made significantly more pre- to post-video changes in knowledge, drive for thinness and intention to diet than a similar non-intervention control group (*n*=114), but only changes in knowledge were maintained at follow up. High levels of personal relevance (both subjective measures in which the participant indicated whether they felt the intervention was relevant to them, and objective measures indicating some pathology or high risk status for body concerns) on the part of both intervention and control groups were associated with greater pre-post attitude changes in measures of drive for thinness and body dissatisfaction and higher objective personal relevance was associated with greater changes in these variables at one month follow up. Neither need for cognition nor elaboration likelihood (or need for cognition X subjective personal relevance) were predictive of more attitude change at post-test or at one month follow up than the control group. It is possible that, while need for cognition and personal relevance may predict *motivation* to elaborate, the design of the program might not have provided girls with the *opportunity* to elaborate, thus preventing 'central route' processing. That is, as post-video measures were taken immediately after the videotape was shown, girls were not given the time or opportunity to think through and elaborate on message arguments. Consequently, the program design may have prevented central route processing.

Therefore the current study aimed to replicate some of the findings of Withers et al. (2002) and examine the impact of additional post-video activities designed to increase the

opportunity for elaboration and thus the likelihood of 'central route' attitude change. Two media for presenting post-video activities were examined and compared, one based on a discussion group format and the other on a similarly structured written format. In addition, these two formats were compared to a control (non-elaboration) discussion group, designed to control for confounding factors such as longer intervention time and facilitator attention.

Guided discussions can be engaging for young people; the facilitators can provide immediate psychoeducation to correct false beliefs and ensure all group members are contributing to the discussion; and listening to peers advocate healthy body image attitudes may provide additional persuasive value (Wertheim, Paxton, Schutz & Muir, 1997). Yet effective discussion groups may be impractical in classroom situations when multiple facilitators need to be employed; and some girls are likely to participate in group discussions more than others so low participators may not process the information as thoroughly. A well-designed individual written task may have the advantage of engaging all girls equally and is potentially cost-effective.

The first aim of this study was to examine whether there were differences between specific intervention conditions. It was first asked whether a videotape plus discussion intervention would be superior to no intervention and, further, whether there would be differences between post-video discussion groups involving elaboration on the issues presented in the videotape and a) the video only group, and b) the control discussion group. The study also examined differences in outcome between the two formats of elaboration post-video activities: the *verbal* elaboration and *written* elaboration groups. A second aim was to examine whether ELM receiver characteristics, specifically need for cognition and personal relevance, predicted attitude change overall. Finally, potential interactions between these receiver characteristics and type of activity group were also explored.

Method

Participants

Participants were 388 girls in Grade 7 (aged 12-13 years) from six private girls'
secondary schools in Melbourne, Australia. All schools were of middle to upper socio-
economic status. Data from three of these schools ($n=218$, 74.5% response rate) were
collected in a previous study (Withers et al., 2002), of which two schools received no
intervention (the *non-intervention control group*; $n=114$), and one school received only a
preventative videotape as an intervention (the *video only group*; $n=104$). New data were
collected from girls at three schools ($n=187$, 73.6% response rate). This sample was called the
extended intervention group.

The mean age of all girls included in the analyses was 12.6 years (*SD*=.52) and mean
body mass index (kg./m.^{2}; BMI) was 19.62 (*SD*=3.29). Ninety-two percent of girls were born
in Australia, 4% in Asia, and 2% each in the Middle East and Europe. Parents' countries of
birth were: 70% Australia, 4% Middle East, 6% Asia, 12% Europe, 5% Africa and 7%
unknown.

Materials

The pre-video questionnaire included five knowledge items, based on the videotaped
message (Withers et al., 2002). The Body Dissatisfaction (EDI-BD) and Drive for Thinness
(EDI-DT) subscales of the Eating Disorders Inventory (Garner, Olmstead & Polivy, 1983)
were used, together with a glossary of some terms as recommended for younger participants
(Banasiak, Wertheim, Koerner, & Voudouris, 2001). As appropriate for non-clinical
populations, untransformed responses were summed for each scale (Schoemaker, van Strien,
& van der Staak, 1994). Cronbach's alphas for the present study were .91 for EDI-BD and .90
for EDI-DT.

The Contour Drawing Rating Scale (Thompson & Gray, 1995) portrayed two sets of nine female figure outline sketches ranging from very thin (1) to very large (17), with odd numbers under figures and even numbers half way between. Girls selected the figure that best represented their own body size (Current Figure) and the body size they would like to be (Ideal Figure). Size Discrepancy was calculated as Current Figure -Ideal Figure. Size Discrepancy ratings have been found to be stable ($r = .88$) over a five-week period in adolescent girls (Banasiak, et al., 2001).

Three items measured girls' history of dieting behavior, by asking how often girls have dieted, how old they were when they first dieted, and what behaviors they use to diet. A three-item food abstention scale from the Extreme Weight Loss Behaviors scale (Paxton et al., 1991) assessed crash dieting, fasting and meal skipping and has been found in adolescents to represent a discrete factor separate from moderate dieting (Benedikt, Wertheim, & Love, 1998). Intention to Diet was measured by a single item 'How likely are you to go on a weight loss diet in the future?', rated from 1 ('definitely unlikely') to 5 ('definitely likely') (Heinze et al., 2000).

To measure subjective personal relevance, the shortened Personal Involvement Inventory, (PII; Munson J, McQuarrie, 1987), first developed by Zaichkowsky (1985), was adapted for use. At Time 1, girls were informed that they would be viewing a videotape on body image and dieting and they then responded to "I think the videotape (on body image) will be…" using the items of the PII, rated from 1 (e.g., *not needed by me*) to 7 (e.g., *needed by me*). Munson and McQuarie (1987) found satisfactory levels of internal consistency (alpha = .95), test-retest reliability, and convergent and predictive validity. Cronbach's alpha for the present study was .91.

The shortened version of the Need for Cognition Scale (NC; Petty & Cacioppo, 1986) includes 18 self-statements (e.g., "I prefer simple to complex problems") rated from 1

(*definitely do not agree*) to 5 (*definitely agree*). Internal consistency, split-half reliability and convergent and discriminant validity have been reported to be good (Petty & Cacioppo, 1986). Cronbach's alpha for the present study was .77.

The post-video questionnaire and follow-up questionnaire consisted of all the same measures described in the pre-video questionnaire, except the dieting history items, the PII and NC.

The Preventative Videotape

The 22-minute videotape was designed and constructed by Heinze et al. (2000) for a previous intervention study. Content included: 1) determinants of body size and shape, variation in the "normal" female appearance, natural weight gain during puberty; 2) historical and sociocultural influences on female appearance, the media's role in shaping this ideal; 3) the negative effects of extreme dieting, eating disorders and their harmful consequences, emotional eating and its triggers; 4) healthy eating habits, the importance of healthy eating; and 5) suggestions for creating a healthy body image and boosting self-image. While a description of eating disorders and some of the negative experiences associated with eating disorders were discussed, harmful weight-loss methods (i.e., use of laxatives, diuretics or slimming pills) were not described.

Activity groups

Three *extended intervention* activity groups were developed: the verbal elaboration group, the written elaboration group, and the control discussion group. The *verbal elaboration group* consisted of a 45 minute structured verbal discussion based on issues such as why girls diet, the consequences of dieting, ways to deter girls from dieting, and healthy alternatives to weight management. Group leaders asked five main questions which girls discussed in small

groups. Questions included: Why do you think that some girls go on a diet to lose weight? Why is it not a good idea to diet? What do you think is the strongest reason not to diet? If it were your job as a school counsellor to help girls not diet, what would you say to girls who want to diet to lose weight? What do you think are some positive things girls can do instead of dieting to help them feel better about their bodies? Each facilitator had a checklist of answers that needed to be raised by the group to ensure that all groups covered the main answers. The facilitator suggested an answer if it was not raised by the group.

Following the discussion, girls completed a word game as a team, in which 20 short statements were presented on large cards and girls matched two of the statements to form a logical argument. For example, one statement, "*During puberty girls develop breasts and their hips, thighs and bottoms get bigger*" needed to be paired with a second statement, "*Puberty is not a bad thing, its a normal part of developing into a healthy woman*" to form a logical argument about puberty. Other argument topics included statements about the thin-body ideal, media influences, cultural changes in the perception of beauty, the consequences of dieting, eating disorders.

The *written elaboration group* was a 10 page written exercise booklet, which contained identical questions to those asked in the verbal elaboration group, including the word game. Girls independently answered questions in the booklet, and did not discuss the questions with other students. Girls were told to take their time and think carefully about questions as they had 45 minutes to complete the booklet. Girls were then provided with the answers to questions to the word game and corrected their own responses.

The *control discussion group* was designed as a non-elaboration group and consisted of a 45 minute structured verbal discussion based on questions pertaining to the heuristic qualities of the videotape, such as sound and picture quality, use of graphics. Girls were asked to discuss how to improve the production of the videotape and to not comment on the content

of the material in the videotape, to avoid central route processing (high elaboration), and were verbally prevented from doing so by the group facilitators.

Procedure

Following relevant ethics approvals and obtaining active informed consent from parent and participant, girls at six private girls' schools participated in the study. Girls at three schools watched the videotape and then girls within those schools were randomly assigned to one of the extended interventions (verbal elaboration, written elaboration or control discussion), and data from girls in a non-intervention control group and a video only group from previous research (Withers et al., 2002) were used again for this study. At Time 1 all girls filled in the code-numbered pre-video questionnaires. Two weeks later, (Time 2) an intervention was delivered to all girls except those in the non-intervention control group. All girls were then administered the post-video questionnaire. A month after Time 2 (Time 3), all girls completed the follow-up questionnaire. Then three months after Time 2 (Time 4) girls in the extended intervention groups only, were administered the follow-up questionnaire again.

Girls self-reported height and weight on the post-intervention questionnaires. All girls were assisted to measure their height, and weighing scales were provided for girls to weigh themselves. Previous research has found high correlations between self-reported weights and actual weights in adolescents (Brener, Mcmanus, Galuska, Lowry, & Wechsler, 2003).

The intervention at Time 2 for the video only group consisted only of a group viewing of the preventative videotape in an auditorium. For the extended intervention groups, the girls similarly watched the preventative videotape in an auditorium and then immediately afterwards were randomly assigned to one of three activity groups: verbal elaboration, written elaboration and control discussion. At one school (*n*=67) the teachers inadvertently divided the girls by friendship group. These groups, however, were then randomly assigned to

condition. For all other schools the individual girls were randomly assigned to intervention groups. Discussion groups (7-10 girls) were facilitated by female post-graduate psychology students. At each school one facilitator supervised the written elaboration group and ensured girls did not discuss their answers with other students.

Most discussions were audio taped and rated by an independent judge who recorded amount of time girls discussed content related to the video. The elaboration groups included an average of 45 minutes of content discussion, compared to 2 minutes of content related discussion (unintentional contamination) for the control discussion group. In the elaboration discussion groups, the judge concluded that all groups raised the same arguments, and there were no major deviations in content of the discussion.

Statistical Analyses

In the extended intervention groups, an attrition rate of 9% (17 of 189 participants) at Time 2 resulted in 170 participants included in the main analyses. A further 17 and 6 girls were missing at Times 3 and 4 respectively. Analyses comparing the girls who were missing at each time point with girls present at that time point showed no differences in mean Time 1 BMI, EDI-BD, EDI-DT, knowledge, intention to diet or size discrepancy.

An ANOVA on Time 1 scores for the five groups revealed no differences in EDI-DT, size discrepancy, knowledge, or intention to diet, but girls in the non-intervention control group had a tendency for higher EDI-BD scores than girls in the written post-video elaboration group, $F(4,380)=2.42$, $p=.05$. There was no difference in BMI between non-intervention controls and girls in the extended intervention group. The video only group had a slightly lower BMI than two of the extended intervention groups: the control discussion group and written elaboration group, $F(4,366) = 4.7$, $p<.001$. Time 1 EDI-BD and BMI were therefore used as covariates in relevant analyses. To control for small differences in Time 1 raw scores,

analyses were conducted on change scores (Time 1-2; Time 1-3; Time 1-4) for each

dependent variable (DV). The change scores for each treatment group satisfied assumptions

of multivariate analyses. Across 15 variables, 21 univariate outliers with a *z*-score of greater

than 3.29 (*p*<.001) were brought to one unit larger than the next largest score in the

distribution (see Tabachnick & Fidell,1996). Analyses using raw data (outliers unchanged)

resulted in no differences in outcome. Results reported are based on analyses on trimmed data

(outliers reduced).

    To examine differences between the extended interventions and non-intervention control

group a series of univariate analyses of covariance (ANCOVAs) were performed on the Time

1-2 and Time 1-3 change scores, using Time 1 EDI-BD as a covariate. As the main analyses

were driven by three theoretically focused questions, planned comparisons were used to

compare specific treatment groups. Planned comparisons can be used as an alternative to

ANOVAs and have the advantage of conserving power when some of the comparisons that

the ANOVA would include are not relevant to the specific research questions at hand

(Keppel, 1991). The comparisons are described with the results of the analyses. Finally,

correlations and a series of ANCOVAs were used to compare differences in receiver

characteristics across treatment groups, using Time 1 EDI-BD as a covariate. For all analyses,

alpha was set at .01 to guard against risk of Type I error.

<div align="center">Results</div>

Descriptive Information

    Dieting behavior – Of all girls in the study, 39% said they had dieted in the past, and

4% of all girls said they had dieted many times. While most girls reported starting dieting at

age 11 or 12, the youngest age of dieting reported was 8. Thirty three percent of girls reported

using at least one form of extreme weight loss behavior: 12% reported fasting 'occasionally',

1% 'at least weekly' and 1% 'daily'. On the crash dieting measure, 23% said 'occasionally',

7% said 'at least weekly' and 1% said 'daily'. For skipping meals, 25% said occasionally,

10% said ' at least weekly' and 2% said 'daily'. Thirty-five percent of girls said they were

likely to diet in the future, and 29% said they were unsure. When asked to indicate which

body figure sketches represented their ideal and current body sizes, 72% of girls chose a

smaller ideal size than their current size.

Need for cognition - A t-test comparison of present study need for cognition means

with mean need for cognition scores of undergraduate students (mean need for cognition = 64,

Haugtvedt & Petty, 1992) found that the mean need for cognition score for the present sample

was significantly smaller, $t(355) = -11.67$, p<.001. Compared to another sample of

adolescents (mean age=15, mean need for cognition = 55; Bakker, 1999) the present group

was significantly higher, $t(355) = 7.89$, *p*<.001.

Preliminary analyses comparing combined extended intervention groups and non-intervention control

Table 1 displays means and standard deviations of the five DVs at Time 1, 2 and 3 for

the combined extended intervention treatment groups (video plus verbal elaboration, written

elaboration and control discussion groups) and the non-intervention control group. The video

only group was not included in these analyses because this group was compared to the control

group in the study described in the introduction (Withers, et al., 2000). Results from the

ANCOVAs found that students in the combined extended intervention group made

significantly more Time 1-2 changes on knowledge, $F(2,251) = 108.70$, *p*<.001 ($\eta^2 = .30$),

EDI-DT, $F(2,273) = 8.128$, *p*=.005 ($\eta^2 = .03$), and intention to diet, $F(2,270) = 14.138$, *p*<.001

($\eta^2 = .06$) than the non-intervention control group (NB: due to accidental omission of 3

knowledge items on the Time 2 questionnaire at one non-intervention control school, only the

remaining 38 participants were used in the analyses for the control group on the Time 2

knowledge variable only). No significant differences were found for size discrepancy or EDI-

BD. One-way ANCOVAs revealed that at one-month follow up the extended intervention

group made greater improvements in knowledge, $F(2,223) = 11.12$, $p<.001$ ($\eta^2=.05$), and drive

for thinness, $F(1,238)= 10.35$, $p=.001$ ($\eta^2 = .04$), than the non-intervention control group. No

differences were found for EDI-BD, size discrepancy or intention to diet.

As no three-month follow up data were available for the non-intervention control

group, paired t-tests were performed on Time 1 to Time 4 changes on the DVs for the

intervention group only. At Time 4, girls showed significantly greater knowledge, $t(145) = -$

5.70, $p<.001$, and significantly less drive for thinness, $t(145)= 4.67$, $p<.001$, than at Time 1.

Small decreases in body dissatisfaction did not reach significance ($p=.07$). There were no

differences in size discrepancy or intention to diet.

Main analyses comparing post-video activity groups and the video only group

Three planned comparisons were conducted for each DV (change score) on the

intervention data only. The first comparison was made between the combined verbal

elaboration and written elaboration groups and the video-only group (comparison 1). The

second comparison was between the combined verbal elaboration and written elaboration

groups and the control discussion group (comparison 2). The third comparison was between

the verbal elaboration and written elaboration groups (comparison 3). The set of weighting

coefficients used to examine these comparisons are displayed in Table 2. While comparisons

were not completely orthogonal, Keppel (1991) argues that the meaningfulness of the

research questions is more important than orthogonality.

The results from the planned comparisons on the five dependent variables at Time 2

(change from pre to post intervention) and at Time 3 (change from pre to one month follow-

up) indicated no significant differences between the treatment groups (p's>.01). However,

there was a non-significant tendency for girls in the combined elaboration groups (verbal

elaboration and written elaboration) to show greater increases in Time 1-2 change in

knowledge (M=-3.28, SD=3.12) compared to girls in the control discussion group (M=-2.22,

SD=2.50), $t(138)$= -2.4, p=.02. The same non-significant tendency was found at Time 3,

$t(125)$= 1.79, p=.06.

At Time 4, no significant differences were found between the three post-video activity

treatment groups on Time 1-4 change scores for any dependent variable. Unexpectedly, there

was a non significant tendency for girls in the control discussion group to show greater

improvements in Time 1-4 change in EDI-BD (M=2.86, SD=6.70) than girls in the combined

elaboration groups (verbal and written elaboration) (M=.09, SD=6.30), $t(143)$ =-2.44, p=.02.

There were no differences in change scores between verbal elaboration and written

elaboration group.

In further analyses, ANCOVAs were performed among the four treatment groups using

BMI as a covariate. No differences between treatment groups on any dependent variable were

found.

Examination of receiver characteristics

For analyses on receiver characteristics, all four treatment groups (three post-video

activity groups plus the video only group) were combined and compared with the non-

intervention control group to conserve statistical power. Table 3 displays means and standard

deviations of NC, subjective personal relevance and measures of objective personal relevance

(EDI-BD, prior dieting behavior, BMI). The control group had significantly higher EDI-BD

scores than the treatment group, $F(1,385)$=7.18, p<.01 .

First, need for cognition and personal relevance were correlated with changes in the dependent variables in the intervention group only (see Table 4): significant positive correlations were found between subjective personal relevance (PII) and Time 1-2 change in EDI-DT, and Time 1-3 change in size discrepancy. Higher personal relevance was related to greater improvements. There was a non-significant tendency for girls with high subjective relevance to make more Time 1-2 change in size discrepancy (p=.04), and 1-3 change in EDI-DT (p=.03). Need for cognition did not correlate significantly with any change scores at the three time points.

Objective personal relevance (EDI-BD) was significantly correlated with several change scores at each time point. In relation to Time 1-2 changes, objective personal relevance predicted improvements on EDI-DT, size discrepancy, EDI-BD (p's <.01), and almost knowledge, (p=.015). In relation to Time 1-3 changes, girls with higher personal relevance made more improvements in knowledge, EDI-BD, and size discrepancy. Based only on girls in the three improved treatment groups, there were no significant relationships between personal relevance and Time 1-4 changes scores.

A series of 2 (intervention/control) X 2 (high/low relevance) ANCOVAs examined treatment versus control group differences on the Time 1-2 and Time 1-3 change scores that significantly correlated with subjective or objective personal relevance, using Time 1 body dissatisfaction as a covariate. Only the main effect for personal relevance, and the group by relevance interaction effects were examined. Subjective and objective personal relevance were each dichotomised into high/low personal relevance using a median split (high subjective relevance: M=41.50, SD= 5.02, low subjective relevance: M=27.23, SD=5.63; high objective relevance M=39.90, SD= 6.2, low objective relevance M=21.64, SD=7.25). None of these ANCOVAs was significant (p<.01). Thus, when the relationship between personal relevance and change scores was compared to a control group, and initial body

dissatisfactions scores were controlled, there were no differences between the treatment and control groups.

Further exploratory analyses were conducted to examine the relationship between the change scores and two other measures of objective relevance (prior dieting behavior and BMI); however, the overall findings were not significant.

Exploratory analyses on interaction effects between receiver characteristics and treatment groups.

Exploratory analyses examined whether there was an interaction effect between receiver characteristics and activity treatment group type (verbal elaboration, written elaboration and control discussion group). For each of the three receiver characteristics (need for cognition, subjective relevance and objective relevance), high/low dichotomized variables were used. In separate analyses, a series of 2X3 MANOVAs (High/low relevance X Post-activity group) were conducted (separate MANOVAs for each receiver characteristic) on the change scores of the five dependent variables at three time points. No significant post-video activity treatment group by receiver characteristics interaction effects were found for need for cognition, subjective relevance, or objective relevance at any time point, (p's>.01).

Discussion

A first aim of the study was to examine whether the videotaped intervention with a post-video activity resulted in improvements compared to a non-intervention control. Girls who participated in the videotaped intervention with a post-video activity made significantly greater Time 1-2 changes on knowledge (large effect size), drive for thinness (moderate effect size), and intention to diet (small to moderate effect size), than girls in the non-intervention control group. At one-month follow up girls in the intervention group maintained changes in

knowledge and drive for thinness, with moderate and small effect sizes respectively. At three months follow up significant improvements in knowledge and drive for thinness were still evident, but these findings were not compared with a control group and are interpreted with caution. The findings are encouraging, and suggest that short-term improvements in knowledge and body image attitudes can be achieved by a brief one-session prevention program.

The results were consistent with two previous evaluations of the videotaped intervention that also found small to moderate improvements in knowledge, drive for thinness and intention to diet in girls who participated in the program (Heinze et al. 2001; Withers et al., 2002). The longer maintenance of change in drive for thinness in the present study compared to earlier studies provides some evidence that the additional activity groups tended to strengthen the program. However, direct comparisons of the activity groups with the videotape intervention alone did not show significant differences. The findings from these studies provide support for the robustness of the program, and as no iatrogenic effects were found, the program is likely to be safe to administer in school settings at this grade level.

While the overall results of the program were promising, a further aim of the current research was to improve program effectiveness by adding high elaboration post-video activity groups. Contrary to expectations, girls who participated in post-video elaboration activity groups did not make greater changes than girls who watched the videotape alone. Girls in the high elaboration post-video interventions tended to make greater Time 1-2 and Time 1-3 changes in knowledge than girls in the control discussion group, but this did not reach significance. Further research on this finding is required (as well as a tendency for girls in the control discussion to make increased Time1-4 changes in body dissatisfaction) before firm conclusions can be made.

It is not clear why the elaboration discussion groups did not lead to greater changes than the video alone, however, several explanations are offered. First, the videotaped intervention may have already achieved the maximum attitude change that can be realistically attained from a one-off, single session program. It may have been more effective, for example, to use the activity groups as booster sessions in subsequent sessions, repeated over time, rather than as part of a one-shot intervention. Second, other message factors (i.e., argument quality, message repetition) operating within the discussion groups might have created neutral or unfavourable thoughts about the message, thus impeding attitude change. According to the ELM, poor argument quality, or overly repetitions messages, reduce the likelihood of positive attitude change (Petty & Cacioppo, 1986). While the messages designed for the current study were believed to be of high quality, the messages may not have been strong enough to improve body esteem. For example, when examining message quality of anti-dieting messages, Paxton, Wertheim, Pilawski, Durkin, and Holt (2002) found that girls rated anti-dieting messages as important and believable but said the message did not help them feel better about their bodies. Even if some of the messages were of high quality, they may not have addressed some of the core difficulties that adolescent girls experience that prevent them from changing their beliefs and behaviours. That is, adolescent girls who are living in an environment that strongly pressures them to conform to thinness ideals may be capable of and motivated to change, but may see themselves being in too vulnerable a position in relation to those social norms and expectations to risk changing.

Finally, as most adolescent girls have heard eating disorder prevention arguments before (Paxton et al., 2002), it is possible that some girls found the content of the high elaboration groups too repetitive, which resulted in neutral or reduced message acceptance in those girls. Other explanations to consider were that the questions did not stimulate *enough* thinking or elaboration; that girls varied in their levels of participation within discussion

groups; or that early adolescents in general have lower levels of elaboration than adults which makes them less likely to think through message arguments.

Our method of experimentally increasing elaboration was a new approach to ELM research that had not been previously tested. While other ELM studies have increased elaboration by manipulating the relevance of the message to their participants (e.g. Andrews & Shimp, 1990; Petty & Cacioppo, 1986), this option was not available for our topic-specific research. Therefore, it is possible that attempting to artificially increase elaboration, by forcing girls who are low in need for cognition or personal relevance to think more about the message, is ineffective. That is, for the high elaboration girls, providing increased opportunity to elaborate did not appear to be more successful in leading to greater attitude change.

When a written elaboration format and the verbal elaboration format of post-video activity were compared, no differences were found. However, as neither discussion groups produced greater change than the video alone, the true difference between these message formats could not be examined. Other factors described earlier, such as message content (weak arguments, message repetition), or low elaboration likelihood, may have prevented greater changes for girls in either of these groups therefore appear to have limited the effects of either message format. Conclusions regarding difference in effectiveness of the message formats are deferred until further research can be conducted.

In relation to the effect of receiver characteristics, consistent with the findings in Withers et al. (2002), correlations showed that girls with higher subjective personal relevance, made greater Time 1-2 and Time 1-3 improvements in drive for thinness and size discrepancy compared to girls with lower personal relevance. However, when compared to a control group and after controlling for initial scores in body dissatisfaction, the differences between high and low subjective relevance were not significant. Similar findings were observed for objective personal relevance. Correlations on the treatment group data showed that girls with

higher objective relevance made greater changes in body dissatisfaction, drive for thinness, and size discrepancy than girls lower in personal relevance. However, when compared with a control group and after controlling for initial body dissatisfaction scores, the difference between high and low objective personal relevance was not significant. No relationship between need for cognition and attitude change was found for any Time 1-2 or Time 1-3 change scores.

Given that the main objective relevance measure used here, body dissatisfaction, is essentially a risk factor for eating disorders, the current findings are not consistent with previous studies that have found larger changes for high risk girls (Huon et al., 1997; Neumark-Sztainer et al., 1995; Stewart et al, 2001). Thus it appears that in the current study, that the current videotape intervention does not differentially target high risk girls, nor does it have detrimental effects in either group. The differential impact of interventions on girls of high and low risk status therefore appears to depend on the specific intervention used.

The findings demonstrated that girls with high and low levels of subjective and objective relevance both made immediate changes in knowledge, drive for thinness and intention to diet, and do not support suggestions that interventions should target only high risk girls (Killen et al., 1993; Stewart et al., 2001). While it is important to continue examining differences between high and low risk girls, we believe that primary prevention programs are potentially valuable to all adolescent girls. Furthermore, prevention programs potentially can offer protective effects, such as preventing onset of negative body image attitudes or development of unhealthy weight loss behavior in asymptomatic girls (Neumark-Sztainer et al., 1995).

Differences in attitude change based on level of need for cognition were not evident in this study. As the mean need for cognition scores in the present sample were significantly lower than means of an adult sample, it is possible that the effects of high versus low need for

cognition observed in adult studies were not as powerful in an early adolescent sample. Early

adolescents as a group may be low elaborators and have not developed their full potential to

think carefully and critically about persuasive messages. This may contribute to their

vulnerability to societal and media influences, and provides further support for the importance

of educating and encouraging adolescents to scrutinise and critically analyse negative body-

image messages in the media (e.g., Levine, Piran & Stoddard, 1999), thus developing their

ability to elaborate. The finding of low need for cognition in the sample has several further

implications.

First, adolescents may need greater encouragement to think through concepts from

prevention messages than program facilitators have previously provided. Second, program

providers may have previously underestimated the importance of heuristic qualities of their

programs and the persuasive power that image and presentation quality may have on

adolescents. For example using famous or popular presenters, technologically

advanced graphics, and communication tools (e.g. computer programs, dvds/ movies) to

deliver the information may enhance the persuasiveness of messages more than previously

anticipated. We believe powerful heuristic cues in combination with high quality message

arguments are likely to produce the best results.   Finally, adolescent ´need for

cognition´ norms are required before differences between adults and adolescents can be

clearly understood.

Finally, the exploratory analyses did not reveal interaction effects between receiver

characteristics and activity treatment group at any time point. That is, there was no difference

in attitude change across activity treatment groups for girls high or low in need for cognition,

subjective personal relevance, or objective personal relevance. This finding was inconsistent

with previous research that found individuals with high versus low elaboration likelihood

responded differently to different message formats (e.g. Bakker, 1999). Bakker (1999) found

individuals with higher need for cognition responded more favourably to an intellectually stimulating format (detailed information packed pamphlet) compared to a non-cognitively demanding format (a cartoon message), and vice versa. Conversely, in the present study the cognitive effort required for *all* post-video activity groups was generally high. As there was not enough variation in cognitive effort required between the three activity groups, this may explain why no Elaboration Likelihood X Group interaction effects were found.

A limitation of the current study involved allocation to groups in which some conditions were not randomly assigned.   Specifically, the verbal, written and control discussion groups were randomly allocated within schools; however, the video-only and non-intervention conditions were data collected from separate schools previously. Thus idiosyncrasies of particular schools and cohort effects due to time or place may have influenced findings in which separate schools were compared.

The findings demonstrate that a short, single session intervention in a videotape format can be effective at producing short-term improvements in knowledge, drive for thinness, and intention to diet. Our one month and three month follow up data suggests that in the short term small changes in attitudes can be sustained. However, longer follow up data such as at one or two years post-intervention need to be measured to determine whether changes can be sustained long term. In addition to this method, we are reminded that the ideal goal of primary prevention is to reduce the potential onset of new symptomatology. Therefore, the true value of the program would be recognized if the non-intervention control group were found to have a deterioration in body image and eating attitudes compared to the intervention group, which remained stable over time.

While a short term intervention can be useful, in order to maximize the likelihood for long term changes to be sustained we feel it is important that ongoing prevention work with adolescents is undertaken. Longer term changes could potentially be produced by using the

videotape within a broader intervention program involving families, the school (teachers, administrators, staff and students) and the wider community (Piran, 1999), and booster sessions could be used throughout the curriculum (e.g., in subjects such as science, physical education/human development), as part of an ongoing commitment to develop healthy body image and esteem in girls throughout their adolescence. In future, researchers can vary both the content and presenters of the post-video activity groups to determine whether other type of post-video activities would be more effective. Considering that small changes in body dissatisfaction were found in programs using self-esteem building exercises (O'Dea & Abraham, 2000) the combination of these alternative activities with the videotaped program would be worth exploring. The intervention(s) need to be assessed over longer follow-up periods and compared at each time point with non-intervention controls.

In conclusion, the positive results in the current research provided further support for the use of videotapes as a cost effective, easily implemented medium that could be used alone or within a broader intervention approach. From a research perspective, videotapes offer an ideal method of controlling certain program components while systematically varying others. The current study provided an important step towards integrating persuasion literature into prevention research and while the particular predictor variables examined did not strongly predict outcome, we believe the structure of examining various intervention components (e.g., receiver characteristics, message content and format, message presenter) is a useful way to approach research efforts. We encourage researchers to continue to apply attitude change theories to improve our understanding of adolescent attitude change and develop more effective programs.

References

Andrews, J.C., & Shimp, T.A. (1990). Effect of involvement, argument strength, and

source characteristics on central and peripheral processing of advertising. *Psychology and

Marketing, 7 (3),* 195-214.

Bakker, A.B. (1999). Persuasive communication about AIDS prevention: Need for

cognition determines the impact of message format. *AIDS education and prevention, 11 (2),*

150-162.

Banasiak, S., Wertheim, E., Koerner, J., & Voudouris, N. (2001). Test-retest reliability

and internal consistency of a variety of measures of dietary restraint and body concerns in a

sample of adolescent girls. *International Journal of Eating Disorders,* 29,85-89.

Baranowski, M. J. & Hetherington, M. M. (2001). Testing the efficacy of an eating

disorder prevention program. *International Journal of Eating Disorders, 29,* 119-124.

Benedikt, R., Wertheim, E. H., & Love, A. (1998). Eating attitudes and weight-loss

attempts in female adolescents and their mothers. *Journal of Youth and Adolescence, 27,* 43-

57.

Brener, N. D.A., Mcmanus, T., Galuska, D.A.B., Lowry, R, & Wechsler, H. (2003).

Reliability and validity of self-reported height and weight among high school students.

Journal of Adolescent Health, 32, 281-287

Garner, D.M., Olmstead, M.P., & Polivy, J. (1983). Development and validation of a

multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International

Journal of Eating Disorders*, 2,15-34.

Haugtvedt, C.P. & Petty, R.E. (1992). Personality and persuasion: Need for cognition

moderates the persistence and resistance of attitude changes. *Journal of Personality and

Social Psychology, 63(2),* 308-319

Heinze, V., Wertheim, W.H., & Kashima, Y. (2000). An evaluation of the importance of message source and age of recipient in a primary prevention program for eating disorders, *Eating Disorders, 8, 131-145*.

Huon, G.F., Roncolato, W.G., Ritchie, J.E., & Braganza, C. (1997). Prevention of dieting-induced disorders: Findings and implications of a pilot study. *Eating Disorders: The Journal of Treatment and Prevention*, 5, 280-293.

Keppel, G. (1991). *Design and Analysis: A Researcher's Handbook.* New Jersey: Prentice Hall.

Killen, J.D., Taylor, C.B., Hammer, L.D., Litt, I., Wilson, D.M., Rich, T., Hayward, C., Simmonds, B., Kraemer, H., & Varady, A. (1993). An attempt to modify the unhealthful weight regulation practices of young adolescent girls. *International Journal of Eating Disorders, 13,* 369-384.

Levine, M.P., Piran, N., & Stoddard, C. (1999). Mission more probable: Media literacy, activism, and advocacy as primary prevention. In N. Piran, M.P. Levine, & C. Steiner-Adair (Eds.). *Preventing Eating Disorders: A Handbook of Interventions and Special Challenges.* Philadelphia: Brunner/Mazel.

Littleton, H.L., & Ollendick, T. (2003). Negative body image and disordered eating behaviour in children and adolescents. *Clinical Child and Family Psychology Review, 6,* 51-66.

Martz, D.M., & Bazzini, D.G. (1999), Eating disorders prevention programming may be failing: Evaluation of 2 one-shot programs. *Journal of college Student Development, 40 (1),* 32-42.

McGuire, W. (1968). Personality and susceptibility to social influence. In E.F. Borgatta and W. W. Lambert (Eds.), *Handbook of Personality Theory and Research.* Chicago: Rand McNally & Company.

Moreno, A., & Thelen, M. (1993). A preliminary prevention program for eating disorders in a junior high school population. *Journal of Youth and Adolescence, 22 (2),* 109-124.

Munson, J, & McQuarrie, E. (1987). The factorial and predictive validities of a revised measure of Zaichkowsky's personal involvement inventory. *Educational Psychological Measurement, 47*, 773-782.

Neumark-Sztainer, D., Butler, R., & Palti, H. (1995). Eating disturbances among adolescent girls: Evaluation of a school based primary prevention program. *Journal of Nutrition Education, 27,* 24-31.

Neumark-Sztainer, D., Sherwood, N.E., Coller, T., & Hannan, P.J. (2000). Primary prevention of disordered eating among preadolescent girls: Feasibility and short-term effect of a community-based intervention. *Journal of the American Dietetic Association, 100,* 1466-1473.

O'Dea, J.A., & Abraham, S. (2000). Improving the body image, eating attitudes, and behaviors of young male and female adolescents: A new educational approach that focuses on self-esteem. *International Journal of Eating Disorders, 28*, 43-57.

Paxton, S. J., Wertheim, E. H., Gibbons, K., Szmukler, G. I., Hillier, L., & Petrovich, J. L. (1991). Body image satisfaction, dieting beliefs and weight loss behaviours in adolescent girls and boys. *Journal of Youth and Adolescence, 20,* 361-379.

Paxton, S., (1993). A prevention program for disturbed eating and body dissatisfaction in adolescent girls: A one-year follow-up. *Health Education Research: Theory and Practice, 8,* 43-57.

Paxton, S.J., Wertheim, E.H., Pilawski, A., Durkin, S.J. & Holt, T. (2002). Evaluations of dieting prevention messages by adolescent girls. *Preventive Medicine, 35,* 474-491.

Petty, R.E.,& Cacioppo, J.T. (1986). The Elaboration Likelihood Model of persuasion. *Advances in Experimental Social Psychology, 19,* 123-205.

Piran, N. (1999). The reduction of pre-occupation with body weight and shape in schools: A feminist approach. In N. Piran, M.P. Levine, & C. Steiner-Adair (Eds.). *Preventing Eating Disorders: A Handbook of Interventions and Special Challenges.* (pp. 148-159).Philadelphia: Brunner/Mazel.

Santonastaso, P., Zanetti, T., Ferrara, S., Olivotto, M.C., Maganavita, N., Favaro, A. (1999). A preventive intervention program in adolescent schoolgirls: A longitudinal study. *Psychotherapy and Psychosomatics, 68*, 46-50.

Schoemaker, C, van Strien T, van der Staak C. (1994) Validation of the Eating Disorders Inventory in a non-clinical population using transformed and untransformed responses. *International Journal of Eating Disorders, 15,* 387-393.

Smolak, L. & Levine, M.P., (2001). A two-year follow-up of a primary prevention program for negative body image and unhealthy weight regulation. *Eating Disorders*: *The Journal or treatment and Prevention, 9 (4),* 313-325.

Smolak, L., Levine, M.P., & Schermer, F. (1998a). A controlled evaluation of an elementary school primary prevention program for eating disorders. *Journal of Psychosomatic Research, 44 ,* 339-353.

Smolak, L., Levine, M.P., & Schermer, F. (1998b). Lessons from lessons: An evaluation of an elementary school prevention program. In G. Noordenbos & W.Vandereycken (Eds.). *The Prevention of Eating Disorders.* (pp. 137-172). London: Athlone.

Stewart, D. A., Carter, J. C., Drinkwater, J., Hainsworth, J. & Fairburn, C. G. (2001). Modification of eating attitudes and behavior in adolescent girls: A controlled study. *International Journal of Eating Disorders, 29,* 107-118.

Stice E, Chase A, Stormer, S., & Appel, A. (2001). A randomised trial of a dissonance-based eating disorder prevention intervention. *International Journal of Eating of Disorders, 29,* 247-262.

Stice E., Mazotti L, Weibel, D., & Agras, W.S. (2000). Dissonance prevention decreases thin-ideal internalisation, body dissatisfaction, dieting, negative affect, and bulimic symptoms: A preliminary experiment. *International Journal of Eating Disorders, 27, 206-*217.

Thompson, M, & Gray, J. (1995). Development and validation of a new body-image assessment tool. *Journal of Personality Assessment, 64,* 258-269.

Tabachnick, B.G., & Fidell, L.S. (1996). *Using Multivariate Statistics. Third Ed.* New York: Harper Collins.

Wertheim, E. H., Paxton, S. J., Schutz, H.K.& Muir, S.L. (1997). Why do adolescent girls watch their weight? An interview study examining sociocultural pressures to be thin. *Journal of Psychosomatic Research, 42 (4),*345-355.

Withers, G., Twigg, K., Wertheim, E.H., & Paxton, S.J. (2002). A controlled evaluation of an eating disorders primary prevention videotape using the Elaboration Likelihood Model of Persuasion. *Journal of Psychosomatic Research, 53,* 1021 – 1027.

Winzelberg, A.J., Eppstein, D., Eldridge, K.L., Wilfley, D.W., Dasmahapatra, R., Dev, P. & Taylor, C.B. (2000). Effectiveness of an internet-based program for reducing risk factors for eating disorders. *Journal of Consulting and Clinical Psychology*, *68(2),* 346-350.

Zaichkowsky, JL. (1985). Measuring the involvement construct. *Journal of Consumer Research, 12*, 341-352.

Acknowledgements

Table 1

Means and standard deviations of dependent variables for extended intervention groups

(treatment) and controls at Times 1,2 and 3

		Time 1		Time 2		Time 3	
		M	*SD*	*M*	*SD*	*M*	*SD*
Knowledge	T=	18.82	(2.66)	21.82	(2.76)	20.63	(2.96)
	C=	18.89	(2.93)	17.39	(2.95)	18.95	(3.03)
Body dissatisfaction	T=	29.63	(10.56)	28.22	(11.16)	27.56	(11.14)
	C=	32.95	(11.90)	32.83	(11.91)	32.25	(11.94)
Drive for thinness	T=	17.82	(9.08)	15.61	(8.21)	15.26	(8.20)
	C=	18.73	(9.59)	18.58	(9.78)	17.98	(8.98)
Size discrepancy	T=	2.02	(2.51)	1.95	(2.41)	1.60	(2.10)
	C=	2.28	(2.93)	2.37	(2.71)	2.19	(2.73)
Intention to diet	T=	3.02	(1.18)	2.73	(1.13)	2.81	(1.16)
	C=	3.03	(1.26)	3.16	(1.15)	2.97	(1.31)

T=treatment, C=control. *n*'s*:* Time 1: T=170, C=114, Time 2:T=170, C=114, Time 3: T=153, C=101

Table 2

Weighting coefficients for planned comparisons between treatment groups

	Verbal elaboration	Control discussion	Written elaboration	Video only
Comparison 1	1	0	1	-2
Comparison 2	1	-2	1	0
Comparison 3	1	0	-1	0

Table 3

Means and standard deviations of need for cognition, subjective personal relevance and measures of objective personal relevance.

	Treatment		Control		Main effect
	M	(*SD*)	*M*	(*SD*)	*F*
Need for cognition	58.75	(8.38)	58.36	(9.32)	.16
Subj. personal relevance	67.81	(17.45)	66.51	(15.67)	.43
Body dissatisfaction[a]	29.56	(11.00)	32.94	(11.90)	7.18*
Prior dieting[a]	1.63	(.94)	1.69	(1.00)	.40
BMI[a]	19.53	(3.24)	19.87	(3.41)	.85

*p<.01; [a]*Measures of objective relevance; n's:* Treatment= 241-271, Control= 104-113

Table 4

Correlations among elaboration likelihood receiver characteristics and Time1-2 change scores and Time 1-3 change scores in the intervention group

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.
1. Sub PR																			
2. Body Dis[a]	.29**																		
3. NFC	.09	-.05																	
4. Prior diet[a]	.25**	.47**	.05																
5. BMI[a]	.19*	.49**	-.05	.29**															
6. Know 1-2	.03	.13	.02	.23**	.08														
7. BD 1-2	.02	.26**	.04	-.07	.14	.05													
8. DFT 1-2	.18*	.23**	.04	.19*	.17	-.10	.27**												
9. Size 1-2.	.15^T	.17*	-.03	.04	.07	-.08	.26**	.08											
10. ITD 1-2	.10	.08	-.03	.10	.03	.01	.04	.07	.08										
11. Know 1-3	.02	.14	-.07	.20*	.07	.70**	-.02	-.03	-.10	.02									
12. BD 1-3	.03	.25**	.04	-.02	.13	.01	.67**	.21**	.19*	.05	-.08								
13. DFT 1-3	.14^T	.27**	.12	.21**	.17*	.00	.22**	.61**	.09	.11	-.02	.36**							
14. Size 1-3	.17*	.19*	.05	.13^T	.09	-.02	.20**	.12	.60**	.05	-.02	.31**	.14^T						
15. ITD 1-3	.02	.00	-.06	.06	-.06	-.05	.02	-.03	.11	.55**	-.14^T	.16	.13^T	.14^T					
16. Know 1-4	.04	.13	.01	.26*	-.03	.68**	-.08	-.14	-.21^T	-.12	.77**	.01	-.01	-.03	-.08				
17. BD 1-4	-.14	.16	.00	.01	.12	-.01	.64**	.32**	.16^T	.19^T	-.02	.75**	.34**	.31**	.15	-.08			
18. DFT 1-4	.02	.18	.07	.16	.13	-.15	.18	.65**	.02	.16	-.14	.25**	.73**	.10	.19^T	-.12	.32**		
19. SD 1-4	.15	.10	-.02	.18^T	.14	.09	.24*	.06	.63**	.08	.05	.29**	.15	.74**	.11	.01	.33**	.05	
20. ITD 1-4	-.03	.06	-.10	.16	.02	.01	.03	.03	.15	.43**	-.05	.24	.22^T	.22^T	.64**	.11	.14	.21	.15

^{T} $p<.05$, * $p<.01$, **$p<.001$; Time 1-2 *n*'s = 265-273, Time 1-3 *n*'s= 239-251, Time 4 *n*'s=138- 146;

[a] =Time l measures of objective relevance, Sub PR= subjective personal relevance, Body Dis.= body dissatisfaction (time one), NFC=need for cognition, Know = knowledge, BD=body dissatisfaction, DFT= drive for thinness, Size = size discrepancy, ITD=intention to diet. 1-2, 1-3, and 1-4 = change between Times 1-2, 1-3, 1-4.