Supplemental Online Materials for 'Mechanisms of emotional eating and drinking: Sadness increases approach bias and craving for chocolate and alcohol'

Supplement A: Supporting Figures

Figure A.1.

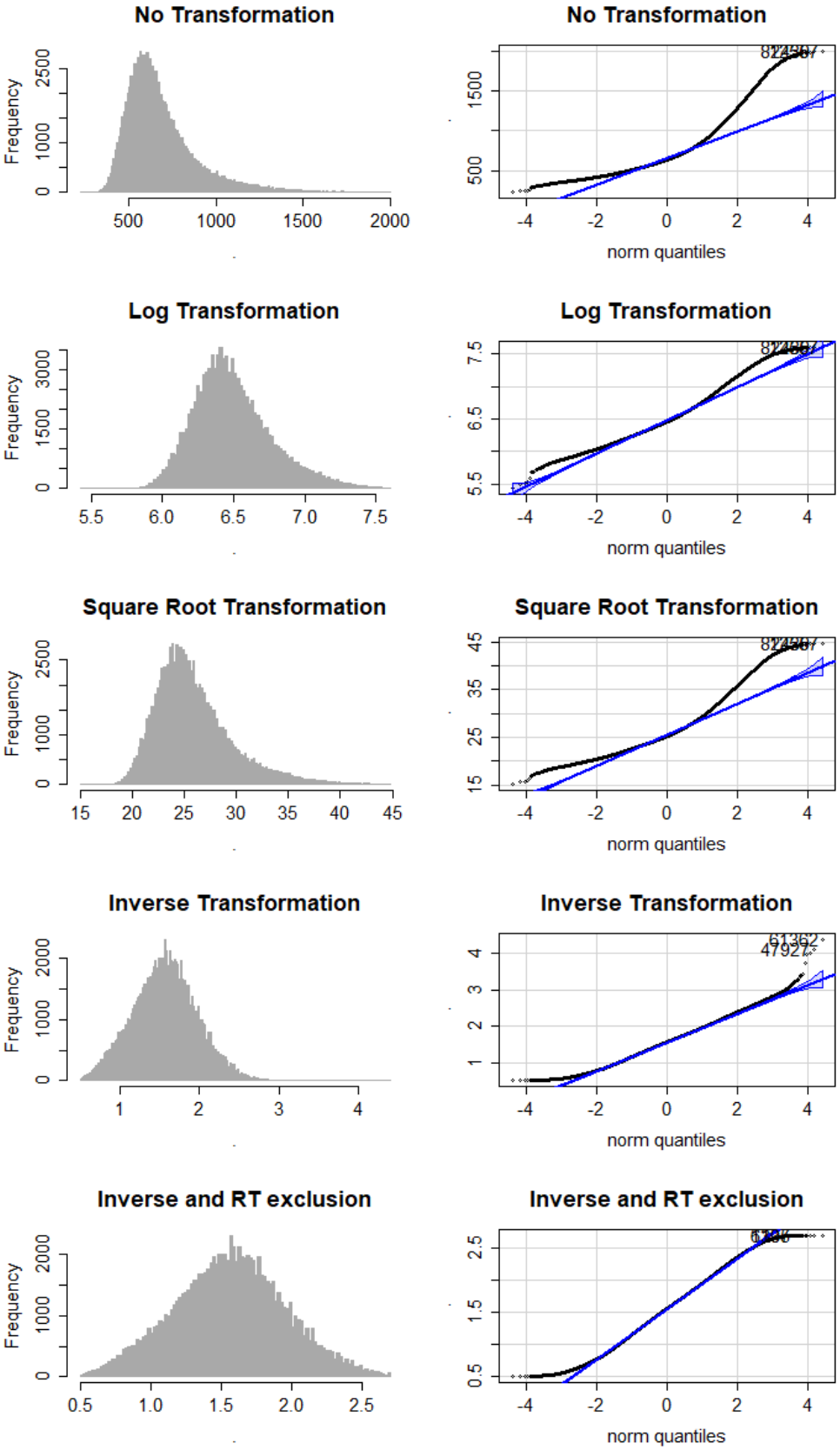
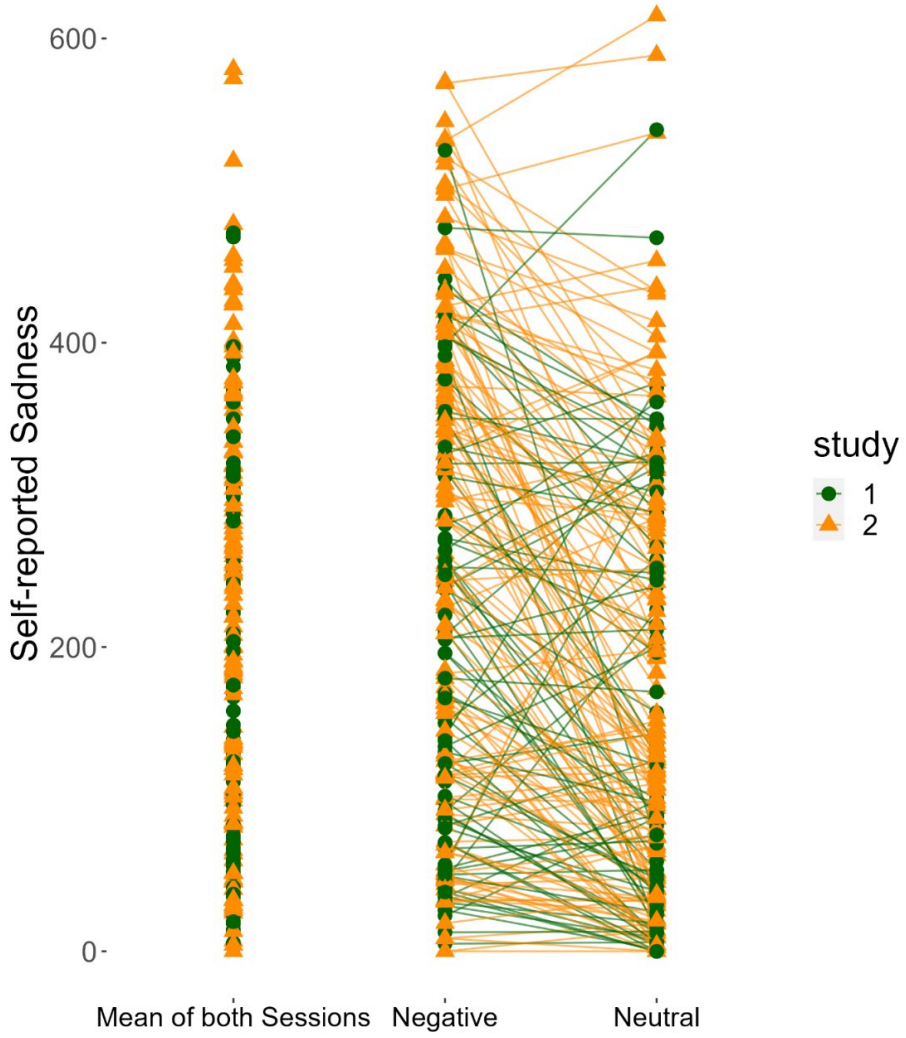


Figure A.2.

Sadness ratings across the two sessions



Note. Sadness ratings contain two sources of variance: (1) interindividual differences in sadness levels across both sessions (between-subject sadness) and (2) sadness rating changes within participants from one session to the other (within-subject sadness). Positive slopes indicated that some participants felt sadder in the sessions with the neutral video clip/memory recall than in the session with the sad video clip/memory recall. In study 1, 40% of participants reported higher sadness in the neutral than in the negative session. This was only the case for 23.7% of participants in study 2. Between-subject sadness correlated with depressive symptoms based on the CESD at r (209) = .54, $p < .001$.

Supplement B: Additional Analyses

1. *Pre-registered Analyses: Similarities between chocolate and alcohol*

We investigated whether approach bias, craving, and self-reported emotional intake were high for chocolate and alcohol in the same subjects, by computing the correlation of each variable for chocolate, with its equivalent for alcohol. For approach bias and craving, we used the mean of the two sessions. As seen in Table B.1., participants with higher chocolate craving and chocolate approach bias had also higher alcohol craving and alcohol approach bias in both studies. For self-reported emotional intake, higher emotional eating was related to higher emotional drinking scores in study 1 and at trend-level in study 2. Based on a reviewer's comment, we also explored the relationship between approach bias and craving. Across studies, both measures were positively correlated for chocolate, r (205) = .18, p = .011, and for alcohol, r (205) = .38, p < .001. Further, the change in approach bias between both sessions correlated with the change in craving for alcohol (r (205) = .17, p = .012), but not for chocolate (r (205) = .04, p = .585).

Table B.1.

Pearson correlations between chocolate and alcohol, for craving, approach bias and emotional intake.

	Study 1		Study 2		Combined	
	r (78)	*p*	*r (129)*	*p*	*r (209)*	*p*
Craving	.63	< .001	.63	< .001	.63	< .001
Approach Bias	.45	< .001	.26	.003	.33	< .001
Emotional Intake	.22	.044	.16	.065	.18	.008

2. *Power Analysis for Study 2 and Additional Sample Size Simulation*

Power for study 2 was calculated by drawing random samples from the previous study. Specifically, we drew 100 samples for each sample size from 70 to 200 participants. These 13000 samples were used to test the hypothesis that the affect-related increase in

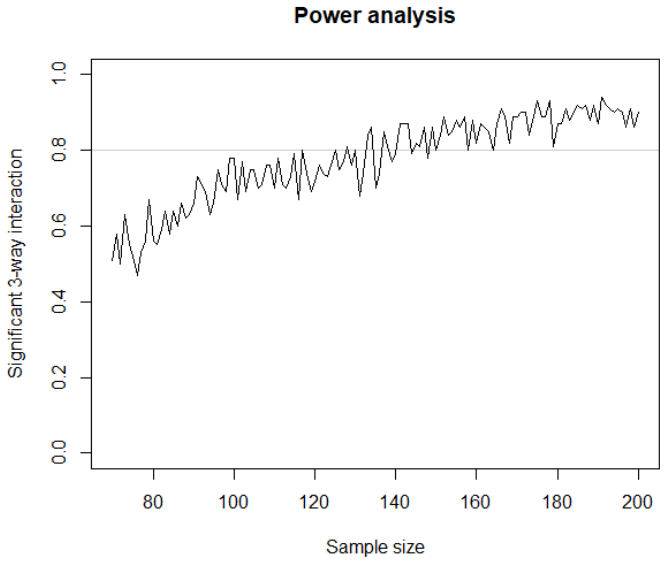
approach differed between food and alcohol by gender, using a multilevel model predicting approach bias with a three-way interaction between affect, substance type and gender according to equation B.1.

(B.1) *Approach Bias ~ Sadness × SubstanceType (Alcohol vs. chocolate) × Gender (male vs. female) + (Sadness | Subject)*

Although this three-way interaction was only exploratory in the first study, we used it instead of the lower-level main effect (i.e., increase in approach bias/craving by affect) as we tried to be more conservative in the power calculation with higher-order interaction effects usually requiring larger sample sizes to achieve sufficient power. For each of the sample sizes, we calculated how many of the 100 randomly drawn data sets revealed a significant three-way interaction. From around 130 participants onwards, the effect started to be significant in about 80 of the 100 datasets (see Figure B.1.), corresponding to 80% power.

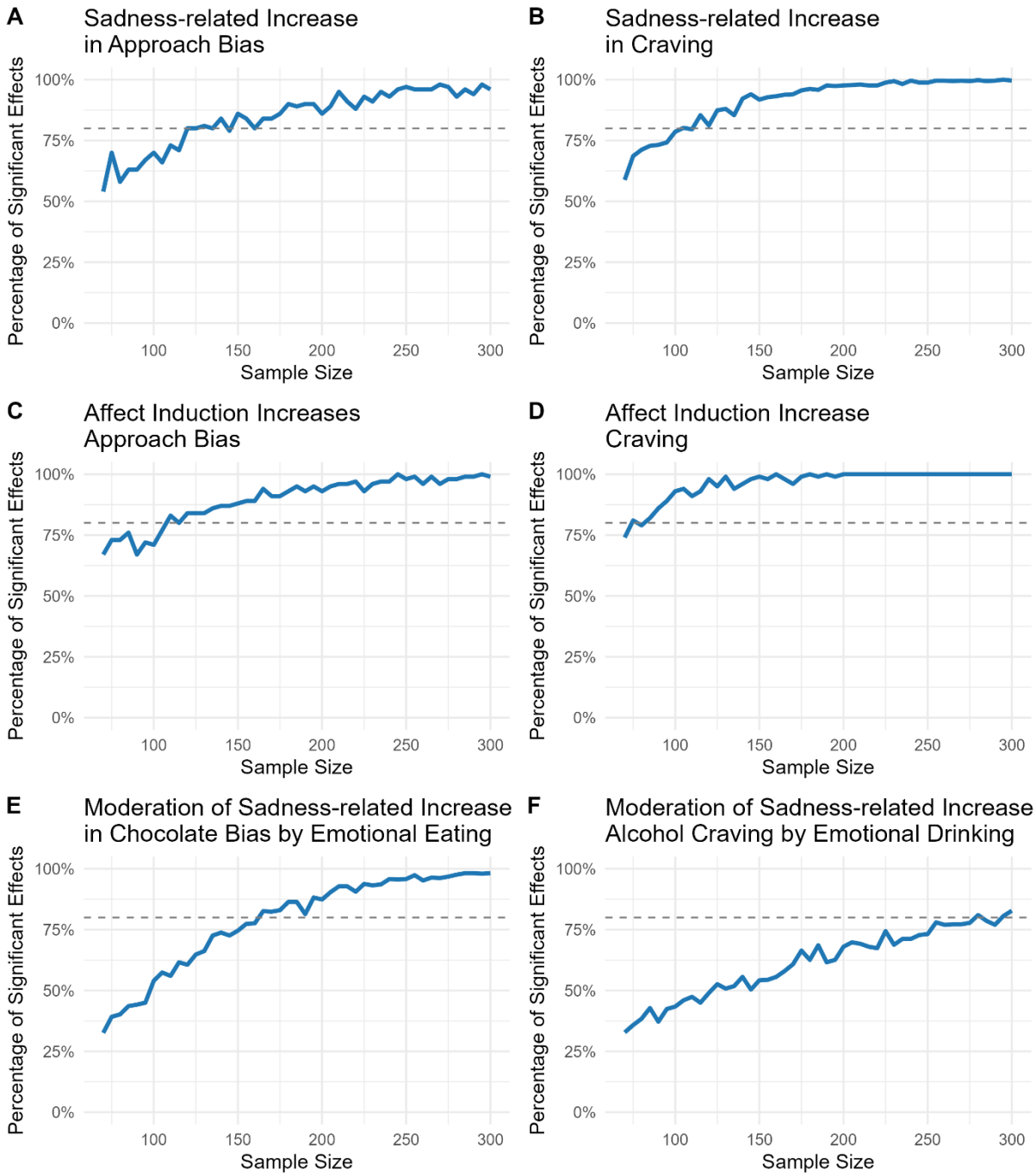
Unfortunately, this significant three-way interaction was based on analyses which confounded within- and between-subject variance, as illustrated in Figure A.1. That is, it remained unclear why chocolate approach biases were strongest in men with high sadness ratings: was it because their bias increased when their sadness levels increased from one session to the other (within-subject variance), or because they generally report higher sadness and have stronger chocolate biases across sessions (between-subject variance)? In our studies, we were only interested in the effects of state-dependent changes in negative affect (i.e., within-subject sadness). As these were not significant after dissociating both sources of variance, the analysis of gender differences in the sadness-related increase for chocolate and alcohol bias was not included in the manuscript.

Figure B.1.



Given that the a-priori power analysis for Study 2 focused on an effect that did not specifically investigate within-subject changes of affect, we also performed a power analysis with the above-described methods to find the required sample size needed to replicate the effects we were actually interested in for a hypothetical third study with 80% power. To reduce run time, we drew random samples from 70 to 300 in steps of five. Affect-related increases in approach bias and craving reached statistical significance in 80% of simulations with sample sizes of approximately 75, 105, 110, or 120 participants onwards, depending on the specific model. Panels A and B of Figure B.2 depict models using within-subject sadness as an operationalization of negative affect, while Panels C and D depict models using the affect induction (i.e., neutral vs. negative) as the predictor. The interaction between within-subject sadness and self-reported emotional eating on chocolate approach bias reached significance in 80% of simulations with approximately 160 participants (Figure B.2.E). The interaction between within-subject sadness and self-reported emotional drinking on alcohol craving reached significance in 80% of simulations with approximately 280 participants (Figure B.2.F).

Figure B.2



3. Validation of the Salzburg Emotional Drinking Scale

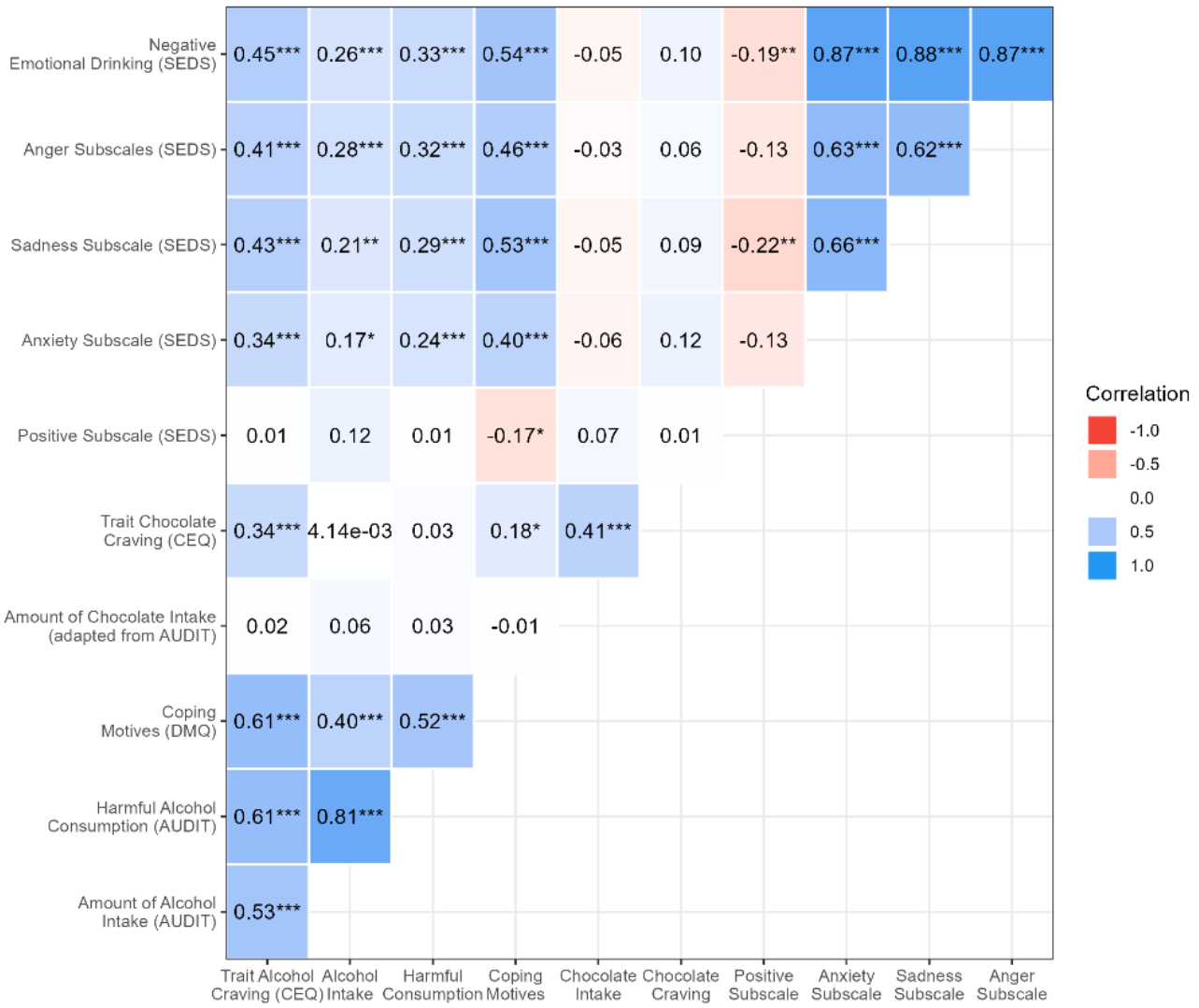
To assess emotional drinking in a parallel way as emotional eating, we adapted the items of the SEES to ask about increased or decreased *alcohol drinking* during the 20 emotions (instead of asking about increased or decreased eating). Thus, the SEDS was created by replacing one word of the SEES. Similar adaptations to the Salzburg *Stress* Eating Scale have already proven successful to assess stress-related alcohol intake (Reichenberger et al., 2024). To get a first indication about the validity of this newly developed Salzburg Emotional

Drinking Scale, we examined its factor structure as well as divergent and convergent validity. Confirmatory factor analysis partially supported the subdivision of the items into the same four subscales as in the SEES, namely happiness, sadness, anger, and anxiety (χ^2 (164) = 352.75, $p < .001$; CFI: .90; RMSEA: .07). To investigate its divergent validity, we correlated its composite negative emotional drinking score as well as its four subscales with chocolate-related variables. As can be seen in the correlation matrix in Figure B.3, we found only very small and non-significant correlations with trait chocolate craving (CEQ) and past chocolate intake (adapted items of the AUDIT). This indicates that the composite score and the four subscales can discriminate against consumption of other substances (here chocolate).

Convergent validity was in turn established through correlations with coping motives (DMQ), measuring if a person is motivated for alcohol intake due to negative affect. Further, we examined associations with variables related to (harmful) alcohol intake. The composite score and all negative emotion subscales, but not the positive subscale, correlated with trait alcohol craving (CEQ), past alcohol intake, and harmful alcohol consumption patterns (AUDIT). These findings align with existing research on emotion-driven consumption, which indicates that negative, rather than positive, emotions are more strongly associated with pathological behaviors. For example, eating in response to positive emotion is associated with lower BMI and less eating pathology, whereas negative emotional eating is related to higher BMI and more eating pathology. Similarly, in the alcohol domain, coping motives (but not enhancement motives) are related to problematic alcohol consumption.

Figure B.3

Correlation matrix



Note. *** = $p < .001$, ** = $p < .01$, * = $p < .05$

4. Models taking multiple covariates into account.

To investigate if our findings were influenced by interindividual differences in harmful alcohol consumption, depressive symptoms, or gender, we re-analyzed our hypotheses in the combined dataset, while including the AUDIT, the CESD, and gender as covariates. Due to strong correlations between CESD-based depressive symptoms and our measure of trait-level sadness, we removed trait-level sadness from the models; the concepts are highly similar and inclusion of both would cause multicollinearity.

For our finding of a sadness-related increase in *alcohol* approach bias and craving, we included the aforementioned factors as shown in Equations B.2 and B.3, respectively. For the sadness-related increase in *chocolate* approach bias and craving, the same models were used,

with the exception that instead of the AUDIT, the amount of chocolate consumption was added to the models.

(B.2) *inv.RTs ~*

Movement × Target × Sadness (WS) +

Movement × Target × AUDIT +

Movement × Target × CESD +

Movement × Target × gender +

(Movement × Target + Sadness (WS) | Subject), + (1 | Stimulus)

(B.3) *Craving ~ Sadness (WS) + AUDIT + CESD + gender + (1 | Subject)*

For alcohol approach bias, the three-way interaction with within-subject sadness remained significant (b = .003, t (45505) = 2.28, p = .022). In addition, there was a significant three-way interaction with harmful alcohol consumption (b = .008, t (200) = 2.71, p = .007), indicating stronger biases for participants with higher scores; there was also a significant three-way interaction with gender (b = -.008, t (196) = -2.96, p = .003), indicating stronger biases for male compared to female participants. For alcohol craving, the sadness-related increase in craving remained significant as well (b = 1.93, t (203) = 3.60, p < .001). In addition, participants with more depressive symptoms and more harmful alcohol consumption reported stronger craving (CESD: b = 4.08, t (203) = 2.96, p = .003; AUDIT: b = 8.04, t (203) = 5.89, p < .001). There was no effect for gender (p = .202).

For chocolate approach bias, we also found the significant three-way interaction with within-subject sadness (b = .005, t (45193) = 3.31, p <.001), but none of the other three-way interactions were significant (p > .384). For chocolate craving, the sadness-related increase remained significant as well (b = 2.05, t (206) = 3.30 p = .001). Further, chocolate craving was higher in participants who reported more chocolate consumption (b = 5.75, t (205) = 4.38, p < .001) and in female participants (b = 3.11, t (205) = 2.35, p = .020). There was no effect for depressive symptoms (p = .115).

In addition, we re-analyzed our finding of a stronger sadness-related increase in alcohol craving in individuals reporting drinking during sadness and our findings of a stronger sadness-related increase in chocolate bias in individuals reporting eating during sadness according to equation B.4 and B.5, respectively. Both findings remained significant (Chocolate bias: $b = 15.88$, $t\,(198) = 2.92$, $p = .004$; Alcohol craving: $b = 1.35$, $t\,(199) = 2.18$, $p = .030$). There were no significant effects for any of the other interactions $p > .227$.

(B.4) *Alcohol Craving ~ Sadness Drinking × Sadness (WS) +*
AUDIT × Sadness (WS) +
CESD × Sadness (WS) +
gender × Sadness (WS) +
(1 | Subject)

(B.5) *Chocolate Bias ~ Sadness Eating × Sadness (WS) +*
Chocolate Consumption × Sadness (WS) +
CESD × Sadness (WS) +
gender × Sadness (WS) +
(1 | Subject)

5. *Operationalising Emotional Drinking and Eating with the composite score the of negative emotion subscales of the SEDS and SEES*

Next to the sadness-specific subscale, we operationalized emotional eating and drinking with the mean score of the three negative subscales of the SEES and SEDS. This composite shore thus reflects how much an individual eats or drinks in response to three negative emotions, namely, sadness, anxiety, and anger. With one exception, findings are consistent with analyses of the sadness-specific subscale.

In study 1, the interactions between emotional intake and within-subject sadness neither attained significance for approach bias nor for craving (chocolate craving: $b = -.12$, $\beta = 0$, $t\,(78.77) = -.10$, $p = .921$, 61.42% in ROPE, PD = 53.93%; alcohol craving: $b = .31$, $\beta =$

.01, *t* (77.42) = .32, *p* = .748, 72.72% in ROPE, PD = 62.58%; chocolate bias: *b* = 13.66, β = .12, *t* (76) = 1.67, *p* = .099, 16.99% in ROPE, PD = 95.08%; alcohol bias: *b* = -6.50, β = -.06, *t* (76) = -.84, *p* = .405, 40.34% in ROPE, PD = 20.58%). Main effects of emotional drinking showed that individuals with self-reported emotional drinking had generally higher cravings (*b* = 6.15, β = .31, *t* (77.74) = 3.39, *p* = .001, .27% in ROPE, PD = 99.97%) and, on a trend level, approach bias (*b* = 15.66, β = .17, *t* (75) = 1.97, *p* = .053, 10.90% in ROPE, PD = 97.30%) across both sessions. These main effects were not present for emotional eating (craving: *b* = 2.26, β = .11, *t* (79.08) = 1.16, *p* = .248, 23.35% in ROPE, PD = 87.42%; approach bias: *b* = 14.31, β = .13, *t* (75) = 1.47, *p* = .147, 18.02% in ROPE, PD = 92.68%).

In study 2, the sadness-related increase in chocolate approach bias was significantly moderated by self-reported trait emotional eating (Figure 7A: *b* = 14.76, β = .13, *t* (123) = 2.32, *p* = .022, 9.24% in ROPE, PD = 98.67%), thereby supporting the trend-level effect from Study 1. For alcohol approach bias, the sadness-related increase was, like in Study 1, not significantly moderated by self-reported emotional drinking at an alpha-level of .05 (*b* = 10.39, β = .11, *t* (123) = 1.83, *p* = .070, 20.45% in ROPE, PD = 96.82%). Additionally, participants reporting emotional drinking again had a stronger approach bias to alcohol in general (*b* = 21.65, β = .20, *t* (122) = 3.11, *p* = .002, 1.33% in ROPE, PD = 99.83%). This main effect was not present for emotional eating (*b* = -3.98, β = -.03, *t* (122) = -.47, *p* = .639, 47.91% in ROPE, PD = 32.05%). For *craving*, we replicated the null results of Study 1 for chocolate (emotional eating × sadness: *b* = -.18, β = -.01, *t* (125.20) = -.25, *p* = .807, 85.13% in ROPE, PD = 60.36%; emotional eating: *b* = -.30, β = -.01, *t* (125.03) = -.17, *p* = .863, 45.61% in ROPE, PD = 43.25%). However, the interaction between sadness and emotional drinking was now a significant predictor of alcohol craving (*b* = 1.21, β = .06, *t* (125.23) = 2.11, *p* = .037, 43.00% in ROPE, PD = 98.17%). Additionally, participants reporting emotional drinking also had higher alcohol cravings in general (*b* = 6.82, β = .29, *t* (124.98) = 3.73, *p* < .001, .11% in ROPE, PD = 99.99%).

Combining the two datasets, we found that the sadness-related increase in chocolate approach bias was stronger in emotional eaters (b = 14.53, β = .13, t (201) = 3.01, p = .003, 4.33% in ROPE, PD = 99.85%), whereas the sadness-related increase in alcohol approach bias was not significantly stronger in emotional drinkers (b = 5.26, β = .06, t (201) = 1.15, p = .252, 54.15% in ROPE, PD = 87.26%). However, individuals reporting high emotional drinking had a stronger approach bias to alcohol across both sessions (b = 18.12, β = .18, t (200) = 3.46, p = .001, 1.03% in ROPE, PD = 99.98%), an effect that was not significant for emotional eating (b = 1.81, β = .02, t (200) = .28, p = .779. For *craving*, the sadness-related increase in chocolate craving was *not* significantly stronger in emotional eaters (b = -.24, β = -.01, t (205.86) = -.40, p = .693, 89.81% in ROPE, PD = 65.12%). Evidence remained inconclusive on whether emotional drinking moderated the sadness-related increase in alcohol craving (b = .96, β = .05, t (204.75) = 1.93, p = .055, 62.04% in ROPE, PD = 97.15%).

Supplement C: Secondary Questionnaires

These questionnaires were completed in the neutral sessions after the Salzburg Emotional Eating and Salzburg Emotional Drinking Scale.

Alcohol Use Disorders Identification Test

The Alcohol Use Disorders Identification Test (AUDIT) assesses the risk for hazardous and harmful patterns of alcohol consumption as well as alcohol dependence (Saunders et al., 1993). It consists of 10 items probing into the frequency, quantity, and recency of alcohol consumption and related problems, on 5-point (8) and 3-point (2) scales rated from 0 to 4. A sum score higher than 8 is indicative of hazardous drinking, as well as possible alcohol dependence. Specifically, scores from 8-15 represent medium levels of alcohol problems, scores higher than 16 high levels of alcohol problems and scores higher than 20 clearly warrant further diagnostic evaluation for alcohol dependence. Reliability was good in both studies (Study 1: $\alpha = .78$; Study 2: $\alpha = .80$). The first two items, namely 'How often do you have a drink containing alcohol?' from zero (= *never*) to four (= *4 or more times a week*) and 'How many drinks containing alcohol do you have on a typical day you are drinking?' from zero (= *1 or 2*) to four (= *10 or more*) were added to compare the usual amount of alcohol intake between both studies. To also assess and compare the frequency and quantity of chocolate consumption across both studies, the first two items of the AUDIT were additionally modified for chocolates (i.e., 'How often do you eat chocolate?' and 'How many pieces of chocolate do you have on a typical day you are eating chocolate?').

Center for Epidemiologic Studies Depression Scale

Depressive symptoms within the last week were assessed with the German version of the Center for Epidemiologic Studies Depression Scale (CESD; Bailer et al., 2012). The short version of this questionnaire assesses subjective impairments associated with depressive symptoms with 15 items (e.g., "I felt depressed") rated on a scale from 0 (= *rarely or not at all/less than one day*) to 3 (= *most, all of the time/5 to 7 days*). Hence, higher sum scores are

indicative of higher depressive symptoms. Reliability was good in both studies (Study 1: α = .91; Study 2: α = .90).

Drinking Motive Questionnaire Revised

The coping motive subscale of the Drinking Motive Questionnaire Revised (DMQ; Kuntsche & Kuntsche, 2009) was used as an established measure for alcohol intake that is motivated by negative emotion. On a scale from 1 (= *never*) to 5 (= *always*), participants rated how often they consumed alcohol in the last 12 month to reduce negative emotion (e.g., “How often do you drink because it helps you when you feel depressed or nervous?” or “How often do you drink to forget about your problems?”).

Supplement D: Formal Equations

Equation 1:

$$inv.RTs_{ijk} =$$

$$(\beta_0 + u_i + v_j) +$$

$$(\beta_1 + x_{1i}) \times Movement_{ijk} + (\beta_2 + x_{2i}) \times Target_{ijk} + (\beta_3 + x_{3i}) \times SadnessWS_{ijk} + (\beta_4 + x_{4i}) \times SubstanceType_{ijk} + \beta_5 \times SadnessBS_{ijk} +$$

$$(\beta_6 + x_{6i}) \times (Movement \times Target)_{ijk} + \beta_7 \times (Movement \times SadnessWS) +$$

$$\beta_8 \times (Movement \times SubstanceType)_{ijk} + \beta_9 \times (SadnessWS \times Target)_{ijk} +$$

$$\beta_{10} \times (SubstanceType \times Target)_{ijk} + (\beta_{11} + x_{11i}) \times (SadnessWS \times SubstanceType)_{ijk} +$$

$$\beta_{12} \times (\mathbf{Movement \times Target \times SadnessWS})_{ijk} + \beta_{13} \times (Movement \times Target \times SubstanceType)_{ijk} + \beta_{14} \times (Movement \times SadnessWS \times SubstanceType)_{ijk} + \beta_{15} \times (Target \times SadnessWS \times SubstanceType)_{ijk} +$$

$$\beta_{16} \times (Movement \times Target \times SadnessWS \times SubstanceType) + \varepsilon_{ijk}$$

where

$inv.RTs_{ijk}$ is the inverse reaction time for participant i, stimulus j and trial k

β_0 is the fixed intercept (across participants and stimuli)

β_1 to β_{16} are fixed coefficients for each predictor (across participants and stimuli)

x_{1i} to x_{11i} are the random slopes for the participants with $N(0,\sigma^2)$

u_i is the random intercept for participant with $N(0,\sigma^2)$

v_j is the random intercept for stimulus with $N(0,\sigma^2)$

ε_{ijk} is the remaining error

Equation 2:

$Craving_{ij} =$

$(\beta_0 + u_i) +$

$(\beta_1 + x_{1i}) \times \mathbf{SadnessWS_{ij}} + (\beta_2 + x_{2i}) \times SubstanceType_{ij} + \beta_3 \times SadnessBS_{ij}$

$\beta_4 \times (SadnessWS \times SubstanceType)_{ij}$

where

$Craving_{ij}$ is the craving rating for participant i and session j

β_1 to β_4 are fixed coefficients for each predictor (across participants and session)

x_{1i} to x_{2i} are the random slopes for the participants with $N(0,\sigma^2)$

u_i is the random intercept for participant with $N(0,\sigma^2)$

Equation 3:

$Chocolate\ Bias/Craving_{ij} =$

$(\beta_0 + u_i) +$

$\beta_1 \times SadnessWS_{ij} + \beta_2 \times Emotional\ Eating_{ij} + \beta_3 \times SadnessBS_{ij} + \beta_4 \times \mathbf{(SadnessWS \times Emotional\ Eating)_{ij}}$

where

$Chocolate\ Bias/Craving_{ij}$ are cravings or approach bias for participant i and session j (depending on the model)

β_1 to β_4 are fixed coefficients for each predictor (across participants and session)

u_i is the random intercept for participant with $N(0,\sigma^2)$

Equation 4:

$$Alcohol\ Bias/Craving_{ij} =$$

$$(\beta_0 + u_i) +$$

$$\beta_1 \times SadnessWS_{ij} + \beta_2 \times Emotional\ Eating_{ij} + \beta_3 \times SadnessBS_{ij} + \beta_4 \times \boldsymbol{(SadnessWS \times Emotional\ Drinking)_{ij}}$$

where

$Alcohol\ Bias/Craving_{ij}$ are cravings or approach bias for participant i and session j (depending on the model)

β_1 to β_4 are fixed coefficients for each predictor (across participants and session)

u_i is the random intercept for participant with $N(0,\sigma^2)$

Supplement E: Additional Tables

Table E.1

*The approach bias (*Movement × Target*) interacts with within-subject sadness across studies*

	Study 1: Trial-level RT				**Study 2: Trial-level RT**				**Integrative Analysis: Trial-level RT**			
Predictors	*b*	*std. Beta*	*df*	*p*	*b*	*std. Beta*	*df*	*p*	*b*	*std. Beta*	*df*	*p*
Intercept	1.53	-.02	81.72	<.001	1.57	-.01	129.79	<.001	1.56	-.01	218.48	<.001
Movement	.07	.19	80.60	<.001	.06	.16	128.16	<.001	.07	.17	209.88	<.001
Target	.05	.12	89.06	<.001	.05	.12	101.60	<.001	.05	.12	89.11	<.001
Sadness (ws)	-.01	-.03	56.90	.489	-.01	-.03	52.72	.467	-.01	-.04	110.79	.251
Substance	.01	.02	98.40	.050	.01	.03	134.44	.001	.01	.03	116.10	.001
Sadness (bs)	-.04	-.10	80.82	.081	.01	.03	127.09	.482	0	0	209.24	.914
Movement × Target	.03	.09	79.96	<.001	.04	.10	127.61	<.001	.04	.10	208.67	<.001
Movement × Sadness (ws)	0	.01	37371	.013	0	.01	59679	.047	0	.01	97134	.003
Target × Sadness (ws)	0	0	37369	.460	0	0	59664	.909	0	0	97116	.792
Movement × Substance	0	0	37377	.751	0	0	59690	.902	0	0	97149	.761
Target × Substance	0	0	59.75	.745	0	.01	59.90	.106	0	.01	59.91	.261
Sadness (ws) × Substance	.01	.02	30.02	.149	0	0	25.19	.536	0	.01	61.46	.184
Movement × Target × Sadness (ws)	**.01**	**.01**	**37366**	**.010**	**0**	**.01**	**59684**	**.011**	**.003**	**.01**	**97134**	**<.001**
Movement × Target × Substance	0	0	37385	.429	-.01	-.01	59692	<.001	0	-.01	97159	<.001

Movement × Sadness (ws) × Substance	0	0	37372	.799	0	0	59684	.729	0	0	97137	.861
Target × Sadness (ws) × Substance	0	0	37374	.501	0	0	59676	.883	0	0	97132	.637
Movement × Target × Sadness (ws) × Substance	0	0	37389	.341	0	0	59690	.954	0	0	97164	.597
ICC	.44				.49				.46			
$N_{subject}$	82				129				211			
$N_{stimulus}$	64				64				64			
Observations	38015				60739				98754			
Marginal R^2 / Conditional R^2	.063 / .473				.043 / .510				.047 / .488			

Note. Sadness (ws) = within-subject sadness; sadness (bs) = between-subject sadness; bold text indicates the effects of the pre-registered hypotheses.

Table E.2

Craving increases with within-subject sadness in Study 2 and in the integrative Analysis

	Study 1: Craving				**Study 2: Craving**				**Integrative Analysis: Craving**			
Predictors	*b*	*std. Beta*	*df*	*p*	*B*	*std. Beta*	*df*	*p*	*b*	*std. Beta*	*df*	*p*
Intercept	45.55	0	84.44	<.001	43.60	0	130.07	<.001	44.30	0	216.51	<.001
Sadness (ws)	**2.05**	**.08**	**15.97**	**.083**	**2.11**	**.10**	**72.07**	**.003**	**2.13**	**.10**	**88.41**	**.001**
Substance	1.71	.08	83.46	.061	2.68	.12	131.20	.001	2.28	.10	215.98	<.001
Sadness (bs)	7.35	.33	87.12	<.001	6.40	.28	130.45	<.001	6.65	.30	217.55	<.001
Sadness × Substance	-.54	-.02	108.23	.486	.32	.02	193.27	.392	.08	0	305.14	.815
ICC	.64				.82				.76			
$N_{subject}$	86				132				218			
Observations	332				526				858			
Marginal R^2 / Conditional R^2	.119 / .684				.103 / .836				.108 / .784			

Note. Sadness (ws) = within-subject sadness; sadness (bs) = between-subject sadness; bold text indicates the effects of the pre-registered hypotheses.

Table E.3

Inter-individual differences: Emotional eating interacts with sadness to predict approach bias

	Integrative Analysis: Chocolate Bias				**Integrative Analysis: Alcohol Bias**			
Predictors	*b*	*std. Beta*	*df*	*p*	*b*	*std. Beta*	*df*	*p*
Intercept	71.38	0	200	<.001	57.57	0	200	<.001
Sadness (ws)	9.25	.08	201	.064	3.78	.04	201	.438
Sadness (bs)	-.90	-.01	200	.892	-1.16	-.01	200	.831
Emotional Eating	-3.74	-.03	200	.563				
Sadness (ws) × Emotional Eating	**14.70**	**.13**	**201**	**.005**				
Emotional Drinking					16.35	.16	200	.002
Sadness (ws) × Emotional Drinking					**4.93**	**.05**	**201**	**.300**
ICC	.24				.06			
N	203				203			
Observations	406				406			
Marginal R^2 / Conditional R^2	.021 / .260				.029 / .083			

Note. Sadness (ws) = within-subject sadness; sadness (bs) = between-subject sadness; bold text indicates the effects of the pre-registered hypotheses.

Table E.4

Inter-individual differences: Emotional drinking interacts with sadness to predict craving

	Integrative Analysis: Chocolate Craving				**Integrative Analysis: Alcohol Craving**			
Predictors	*b*	*std. Beta*	*df*	*p*	*b*	*std. Beta*	*df*	*p*
Intercept	46.72	0	207.63	<.001	42.09	0	206.45	<.001
Sadness (ws)	2.13	.10	205.84	.001	1.90	.09	204.58	<.001
Emotional Eating	.62	.03	206.92	.632				
Sadness (bs)	5.68	.26	207.23	<.001	6.92	.30	206.17	<.001
Sadness (ws) × Emotional Eating	**.88**	**.04**	**205.84**	**.179**				
Emotional Drinking					6.00	.27	205.84	<.001
Sadness (ws) × Emotional Drinking					**1.15**	**.05**	**204.58**	**.026**
ICC				.63				.71
N				210				210
Observations				417				417
Marginal R^2 / Conditional R^2				.078 / .655				.202 / .770

Note. Sadness (ws) = within-subject sadness; sadness (bs) = between-subject sadness; bold text indicates the effects of the pre-registered hypotheses

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