Dude sponsored: how executive function and disclosures moderate the persuasive effects of sponsored online videos on young adults

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Received 4 July 2024
Revised 30 October 2024
Accepted 2 December 2024

Abstract

Purpose – *This study aims to examine how individual differences and contextual factors affect audience responses to sponsored video content. Specifically, this study tests whether executive function (EF, both hot and cool) skills in young adults influence persuasion knowledge and advertising responses. The study further tests the moderating role of disclosure presence and country of participants (US vs The Netherlands).*

Design/methodology/approach – *An online experiment ($N = 368$) with a 2 (disclosure: present versus absent) × 2 (country: US versus The Netherlands) between subjects design featuring young adults ($M age = 21.06$; $SDage = 3.06$) is conducted.*

Findings – *Participants with more advanced cool EF showed a better understanding of the persuasive intent of the video, and hot EF was associated with higher brand recall. In addition, disclosures only enhance the understanding of persuasive intent of the video for people with less advanced levels of hot EF. Lastly, Dutch participants were more responsive toward the disclosure.*

Originality/value – *This study provides key insights regarding how young adults process sponsored content and the role that cognition plays in shaping responses.*

Keywords *Sponsored content, Online advertising, Persuasion processing, Emerging adults, Executive function, Disclosure efficacy*

Paper type *Research paper*

Introduction

As consumers have moved to new platforms (e.g. YouTube; Sweeney *et al.*, 2022), advertisers had to find new mechanisms to reach these audiences which includes integrating persuasive messaging into content that has traditionally been noncommercial (De Veirman *et al.*, 2019). One concern with this approach is that mixing editorial and commercial content might make it difficult for audience members to identify when they are being sold (Boerman and Müller, 2022; Schorn *et al.*, 2022). Specifically, viewers who are unaware of this persuasive messaging may be less critical of the message which could potentially be viewed as a deceptive practice (Cain, 2011).

Considering these issues, this study examines whether there are relevant individual differences which may affect one's persuasive awareness of these messages. To that end, the current study examines whether executive function (EF) skills in young adults (i.e. adults just entering legal adulthood – 18–24 years of age) influence persuasion knowledge (i.e. understanding persuasive intent and skepticism) and consequently what the effects are for their responses to the persuasive messaging (i.e. brand recall, purchase intention, video/brand attitudes). EF is a

set of higher-order cognitive processes that help to monitor thoughts and actions and refers to an array of processes relating to self-control (Carlson, 2005). EF is important in the context of persuasion knowledge, as it has been linked to the ability to impute mental states (i.e. theory of mind), which is crucial in the development and activation of persuasion knowledge (Lapierre, 2015; Castonguay, 2022). Furthermore, EF has been linked to more critical responses toward advertising and reduced product desire among children (Lapierre and Rozendaal, 2019). However, such associations between EF and PK have not been tested among young adults. Therefore, this study examines whether young adults with more robust EF are better able to recognize the persuasive intent of content and are more skeptical.

Furthermore, this study extends previous research by looking at two different types of EF: hot and cool EF (HEF and CEF, respectively; Perone, Almy and Zelazo, 2018). CEF refers to decision-making capabilities that are not connected to affect, while HEF refers to these same decision-making capabilities under emotional constraints (Zelazo and Carlson, 2012). These separate types of EF may have differential effects on message reception as previous work has demonstrated that advertising literacy has both cognitive dimensions and affective dimensions (Rozendaal *et al.*, 2011; Rozendaal, Opree and Buijzen, 2016; Boerman *et al.*, 2018).

In addition, as sponsored content can be difficult to identify as commercial (e.g. Boerman and van Reijmersdal, 2016) regulations require influencers to disclose any advertising (e.g. Campbell and Grimm, 2019). Research shows that disclosures can increase persuasion knowledge and influence brand/ad responses (Boerman and van Reijmersdal, 2016; Eisend *et al.*, 2020). If young adults with less developed EF are less able to recognize persuasive intent and are less critical of advertising, they may need disclosures more than adults with better EF. Therefore, we examine whether EF and disclosure presence interact in activating persuasion knowledge. Furthermore, we examine whether EF and disclosures influence responses to the video and the brands (i.e. brand recall, purchase intention and brand/video attitudes) through persuasion knowledge.

Finally, this study explores whether responses to sponsored advertising are similar across cultures/national contexts. Almost all research into disclosures has been limited to examinations within single countries (see Boerman and van Reijmersdal, 2016), where laws and regulations are quite different (van Reijmersdal and Rozendaal, 2020). Moreover, previous research focused on the countries that were sampled in the current study, The Netherlands and USA, showed that children's consumer socialization is quite different with parents in The Netherlands providing more oversight of their children compared to American parents (Lapierre and Rozendaal, 2018). Therefore, it is important to examine whether these effects are equivalent across countries.

Literature review

Executive function's influence on persuasion knowledge and brand responses

This study's primary focus is to determine how EF among young adults affects their persuasion knowledge and video/brand responses. EF initially emerged as a construct in cognitive development/psychology but EF influences cognition across the lifespan (Ferguson, Brunsdon and Bradford, 2021). EF is defined as the "higher order, self-regulatory, cognitive processes that aid in the monitoring of thought and action" (Carlson, 2005, p. 595). The processes that are frequently identified as part of EF are inhibitory control (i.e. the ability to resist impulses), attentional shifting (i.e. the ability to control attentional resources) and working memory (i.e. the ability to keep information immediately in mind; Diamond, 2013). The development of EF is vital for vocational and social success (Kern *et al.*, 2009). In addition, research on EF and young adults has shown that better developed EF is linked with less risk taking and greater adoption of healthy behaviors (Reynolds *et al.*, 2019).

Beyond these benefits, EF appears to be crucial for persuasion processing (Moses and Baldwin, 2005; Rozendaal *et al.*, 2011). For example, Rozendaal and colleagues (2011) argued that the development of EF is an important part of helping children "stop and think" when engaging with advertising. Specifically, due to the fast-paced and emotionally compelling features of traditional commercials, children need to control their initial responses to persuasive messages before they can think critically about these appeals. Empirical investigations have offered support for this theorizing as Lapierre and Rozendaal (2019) found that improved EF was associated with fewer purchase requests/conflict. In addition, Lapierre (2019) found the same protective effects further showing that the relationship between EF and purchase requests held after controlling for children's persuasion knowledge, age and verbal ability.

Considering these findings with children, it is worthwhile to investigate whether young adults might also yield some benefits as evidence shows that EF is similarly important for this population (Zelazo and Carlson, 2012). First, research shows that the development of EF continues after childhood, extends through adulthood and is at a crucial point during young adulthood as these skills begin to plateau (see Ferguson, Brunsdon and Bradford, 2021). Second, EF can act as an individual difference variable whereby lower levels of EF can affect adult functioning (Reynolds *et al.*, 2019). Moreover, there are elements of the current marketing environment which could prove confounding for younger adults, particularly in the mobile/digital realm as persuasive appeals in these formats are much more likely to blend advertising content with entertaining content (Gunter *et al.*, 2014), which can make it difficult to accurately identify persuasive messaging (Evans, Hoy and Childers, 2018) and respond to it. As such, studying EF and its potential protective influence regarding advertising/marketing communication is particularly salient with young adults as their cognitive skills are at their relative peak but they lack the marketplace knowledge of older adults.

Hot and cool executive function

Furthermore, the current study examines whether two separate types of EF ("hot" and "cool" EF) effects young adults' persuasion processing and their responses. These two differing types of EF influence cognitive processing in unique ways and reflect two separate constructs (Perone, Almy and Zelazo, 2018). CEF is associated with cognitive performance on tasks that are not linked with affect/emotion such as inhibiting an intuitive response to a logic or math problem. For example, with the cognitive response test (Sirota and Juanchich, 2018), participants are given logic/math questions like "In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?". The intuitive response is 24 days, but the correct response is 47. To get the correct answer, respondents need to ignore their immediate intuitions and think more carefully about the answer as getting to this correct answer is not dependent on controlling emotions, it just requires an ability to inhibit an initial cognitive response. Conversely, HEF is focused on cognitive performance when there is a strong affective component and it is linked to the ability to resist temptation or control oneself in an emotional moment (McIntyre, Blacher and Baker, 2006). For example, being able to think clearly about outcomes when engaged in an emotionally wrought task like gambling is seen as a real world test of HEF (Bechara *et al.*, 1994).

This difference between HEF and CEF should produce different effects when participants encounter persuasive messaging. Regarding CEF, we expect that more advanced skills in this area should help with non-affective components related to persuasion exposure. For example, better CEF should be associated with increased understanding of the persuasive intent of messages and brand recall as this skillset likely helps participants sift through the "noise" in the message and focus on the message's intent. With HEF, we expect that improved performance in this area should be linked to affective judgments. That is, if people have trouble controlling their affective responses (low HEF), we do not expect them

to show a critical evaluation of sponsored content, but rather be swayed be its entertaining nature (Rozendaal *et al.*, 2011). Specifically, participants with more advanced HEF will express more brand skepticism and less favorable brand/video responses thus being better equipped to resist persuasion. What is less clear is whether CEF will have any influence on affective judgments and, similarly, whether HEF will influence cognitive outcomes. The following hypotheses and research questions are offered:

H1. People with more advanced CEF will demonstrate higher (a) understanding of the persuasive intent, and (b) brand recall, than people with less advanced CEF.

H2. People with more advanced HEF will demonstrate (a) more advertising skepticism, (b) lower purchase intention, (c) more negative brand attitudes and (d) more negative video attitudes than people with less advanced HEF.

RQ1. What are the effects of CEF on (a) advertising skepticism, (b) purchase intention, (c) brand attitudes, and (d) video attitudes?

RQ2. What are the effects of HEF on (a) understanding of the persuasive intent and (b) brand recall?

Mediation of executive function on brand responses via understanding intent

In addition to the proposed main effects of EF, we explore whether understanding intent and advertising skepticism mediates the relationship between EF and brand responses. Research shows that activation of persuasion knowledge is likely to affect the persuasion process. According to the Persuasion Knowledge Model (Friestad & Wright, 1994), people use their knowledge about persuasion and advertising to cope with persuasion attempts. This means that they use their persuasion knowledge to judge the message and decide whether they want to be persuaded or resist it. A meta-analysis showed that, overall, persuasion knowledge activation results in less persuasion (Eisend and Tarrahi, 2022). For sponsored content, this can be explained by its hidden nature: when people realize that seemingly non-sponsored content is sponsored, they perceive a threat to freedom to make their own decisions (Wojdynski and Evans, 2020). Therefore, we propose that activated persuasion knowledge is likely to result in less persuasion.

Moreover, the mediational processes should be different between CEF and HEF. For CEF, we expect that brand recall will be higher via increased understanding of persuasive intent among participants with better CEF as this relationship should be more cognitively oriented. Conversely, for HEF, the expectation is that because this process is more affective, there will be a mediational pathway through increased advertising skepticism on the outcomes associated with affectively based judgments.

H3. People with more advanced CEF will demonstrate higher brand recall, through better understanding of persuasive intent than participants with less advanced CEF.

RQ3. Is the effect of CEF on (a) purchase intention, (b) brand attitudes and (c) video attitudes mediated by understanding of persuasive intent?

H4. People with more advanced HEF will demonstrate (a) lower purchase intention, (b) more negative brand attitudes and (c) more negative video attitudes through greater advertising skepticism than participants with less advanced HEF.

RQ4. Is the effect of HEF on brand recall mediated by advertising skepticism?

Moderation of disclosure

Research has shown that, in general, audiences find it difficult to recognize advertising in influencer videos (e.g. Boerman and van Reijmersdal, 2016; Rozendaal, van Reijmersdal and van der Goot, 2021). Thus, if EF helps adults recognize and critically evaluate sponsored content in videos, it follows that people with less developed EF are less likely to

use their persuasion knowledge to cope with influencer advertising. A way to help consumers activate and use their persuasion knowledge, is by creating transparency about advertising by means of sponsorship disclosures (e.g. "Sponsored" labels) as these disclosures can help people recognize advertising (Boerman and van Reijmersdal, 2016; e.g. Eisend *et al.*, 2020).

In the context of EF, we argue that people with less advanced EF may benefit most from disclosures but through separate cognitive and affective paths. For people with less robust CEF, a disclosure is expected to attract attention to the advertising, increasing their ability to identify and understand its persuasive nature. It may also help those with less advanced HEF to critically evaluate the advertising. As young adults with more advanced CEF are expected to understand persuasive intent, those with more advanced HEF are expected to critically evaluate sponsored content and a disclosure may not be necessary and thus we expect disclosure effects to be weaker.

Specifically, we expect a moderation effect in which a disclosure contributes most to understanding intent for those with less advanced CEF and has a weaker positive effect for those with more advanced CEF. In addition, we expect the disclosure to increase advertising skepticism mostly for those with less advanced HEF, and expect this effect to be less pronounced, but positive, for those with more advanced HEF. Again, we propose research questions for the effect of CEF on ad skepticism, and for the effect of HEF on understanding intent:

H5. For people with less advanced CEF a disclosure positively affects understanding intent; this positive effect is weaker for people with more advanced CEF.

RQ5. What is the interaction effect of CEF and disclosure on ad skepticism?

H6. For people with less advanced HEF, a disclosure positively affects ad skepticism; this positive effect is weaker for people with more advanced HEF.

RQ6. What is the interaction effect of HEF and disclosure on understanding intent?

In addition, as we expect understanding of persuasive intent and ad skepticism to influence brand/video responses, we also investigate how the interaction between EF and a disclosure influences these outcomes:

RQ7. How does the interaction effect of CEF and disclosure on understanding of persuasive intent influence brand recall, purchase intention, brand attitudes and video attitudes?

RQ8. How does the interaction effect of HEF and disclosure on skepticism influence brand recall, purchase intention, brand attitudes and video attitudes?

Role of country

Finally, we investigate whether the effects of EF and disclosures differ between the USA and The Netherlands. There are crucial differences between the two countries regarding the laws and regulations related to sponsored advertising. In The Netherlands, there is a stronger culture of consumer protection/education and stricter regulations which may affect how people view advertising (Boerman *et al.*, 2018; Lapierre and Rozendaal, 2019; van Reijmersdal and Rozendaal, 2020). This is illustrated by findings that show that US consumers are more favorable to commercial messages than Dutch consumers (van der Goot *et al.*, 2018). Moreover, previous research shows that consumer socialization of young people in these countries is quite different with Dutch parents providing more oversight of their children's consumer socialization compared to American parents (Lapierre and Rozendaal, 2018). These differences may influence the effects of EF on persuasion knowledge and persuasion. As critical thinking about advertising seems more engrained in Dutch culture, EF may be less impactful when compared to the US. However, despite these

differences, no research has yet compared responses to sponsored video content, EF or the effects of disclosures between countries. As such, we offer the question:

RQ9. Does country (US vs The Netherlands) moderate the hypothesized effects?

Method

Procedure and sample

An experiment with a 2 (disclosure: present/absent) × 2 (country: US/Netherlands) between subjects design was conducted with EF measured. Participants were recruited from the universities' (University of Arizona and University of Amsterdam) student subject pools and earned credit for participation. For both samples, the universities provided IRB approval BLINDED. Specifically, university faculty provided links to the survey on Qualtrics where students could participate for credit. After giving informed consent, participants filled out questions about their EF and their demographics. Then, they were randomly assigned to the disclosure conditions and watched the entire video clip embedded in the survey. After, participants answered questions regarding their attitude toward the video, brand memory, understanding intent, ad skepticism, brand responses, attitude, purchase intention, manipulation checks and control variables. Finally, participants were debriefed and thanked.

A total of 409 students initially participated in the experiment, 41 failed the attention check or had significant missing data. The final sample consisted of 368 ($M_{age} = 21.06$; $SD_{age} = 3.06$; 72.7% female) participants: 187 ($M_{age} = 21.60$; $SD_{age} = 3.71$; 59.7% female) American participants and 181 ($M_{age} = 20.50$; $SD_{age} = 2.04$; 86.1% female) Dutch participants.

Stimulus material

Using a list of the most popular YouTube influencers (Richardson, 2021), we selected a video called *Ping Pong Trick Shots 3* from the channel Dude Perfect sponsored by Oreo Cookies as the topic was gender neutral and because Oreos are available in both countries. We cut the video to last for 3:08 min. The video presents an assorted variety of trick shots using ping-pong balls while also displaying the Oreo logo, Oreo packages and Oreo cookies five times for 21 s in total (see here for unedited video- www.youtube.com/watch?v=UeG1ftTmLAg).

The disclosure appeared 8 s after the video started. We used the original disclosure from the video centrally showing the text "Sponsored Advertising by Oreo Cookies" underneath the title of the video on a black background for 6 s (based on Boerman, van Reijmersdal and Neijens, 2012). In the no disclosure condition, the same screen with the title of the video was shown, only the disclosure was removed. Apart from the disclosure, the stimuli videos did not differ.

Measures

Executive function

HEF was measured using a four-point scale ranging from 1 (*never or rarely*) to 4 (*very often*) with the question "how often have you experienced each of these problems during the past 6 months", followed by four items, such as "I remain emotional or upset longer than others" (see supplement for the full measure). The measure was recoded so that higher scores indicated higher HEF ($\alpha = 0.81$, $M = 3.10$, $SD = 0.71$; Barkley, 2011).

CEF was measured with seven questions (see supplement) from the four option Cognitive Response Test (CRT; Sirota and Juanchich, 2018). The CRT is recognized as a valid measure of inhibitory control and tests whether participants can suppress an incorrect intuition and cognitively reflect when solving problems. For example, one item in the test asks: "A bat and a ball cost $1.10 in total, the bat costs $1 more. How much does the ball

cost?" (5¢, 10¢, 9¢ or 1¢). The correct answer is 5¢ and the intuitive response is 10¢. The other two options are included as distractors. The number of items that were answered correctly were used as a measure of cognitive control (KR-20 = 0.73; $M = 2.54$, $SD = 2.07$).

Mediators

Understanding of persuasive intent was measured with 11 items (Boerman *et al.*, 2018) with a scale ranging from 1 (*totally disagree*) to 7 (*totally agree*; see supplement for all items; $\alpha = 0.94$, $M = 5.58$, $SD = 1.07$).

Ad skepticism was measured with five seven-point semantic differentials: "I think that showing the brand Oreo Cookies in this YouTube video is …dishonest-honest, not trustworthy-trustworthy, incredible-credible, not truthful-truthful, and insincere-sincere". With higher values indicating greater skepticism (Boerman *et al.*, 2018; $\alpha = 0.93$, $M = 3.33$, $SD = 1.28$).

Dependent variables

Brand recall was measured by asking if people remembered seeing a brand in the video, and if so, to type out the brand name (69.0% correct; Boerman, van Reijmersdal and Neijens, 2012).

Brand attitude was measured with six seven-point semantic differential bad-good, negative-positive, dislike-like, unpleasant-pleasant, unfavorable-favorable, poor quality-high quality as answers to the question "What is your opinion of the brand Oreo Cookies?" (adapted from Spears and Singh, 2004; $\alpha = 0.94$, $M = 5.80$, $SD = 1.10$).

Purchase intention was measured with the question: "Imagine you are in the supermarket and you see the brand Oreo Cookies. How likely are you to buy this brand?" on a scale ranging from 1 (*extremely unlikely*) to 7 (*extremely likely*, $M = 4.80$, $SD = 1.70$).

Video attitude was measured with three seven-point semantic differentials: dislike-like, negative-positive, bad-good as answers to the question "What is your opinion of the video you just watched?" (Spears and Singh, 2004; $\alpha = 0.92$, $M = 5.25$, $SD = 1.50$).

The questionnaire also included a manipulation check and control variables (see supplemental file).

Results

Effects of executive function

See the supplemental tables for results of the randomization check, zero-order correlations for all variables of interest and power analysis. To test the hypotheses and answer our research questions, we used the PROCESS macro (Hayes, 2022). We used models 4, 7 and 13 as Model 13 tests three-way interactions but does not provide a test of unmoderated mediation effects and only provides results for indirect effects at different levels of the moderator. Similarly, Model 7 tests two-way interactions and moderated mediation effects but only provides results for indirect effects at different levels of the moderator. As such, to get unmoderated mediation statistics and test our mediation hypotheses, it was necessary to analyze the data using Model 4. For all models we used 5,000 bootstrapped samples to generate confidence intervals. We conducted analyses with HEF or CEF as the independent variable, understanding of persuasive intent and skepticism as parallel mediators, disclosure and country as moderators, either brand recall, brand attitude, purchase intention or video attitude as dependent variables and gender and channel viewing as covariates as there were clear gender disparities between countries and channel viewing was linked with the outcome variables. All independent variables were mean-centered for the analyses. Tables 1 and 2 display the direct and moderated effects of HEF and CEF on understanding

Table 1 Main and interaction effects on understanding persuasive intent and skepticism

	Understanding intent			*Skepticism*		
	b (SE)	*t*	*p*	*b (SE)*	*t*	*p*
CEF	*0.721 (0.031)*	*2.323*	*0.021*	0.058 (0.035)	1.656	0.099
HEF	0.062 (0.082)	0.759	0.448	0.017 (0.092)	0.189	0.850
CEF* disclosure	−0.054 (0.061)	−0.888	0.375	−0.051 (0.069)	−0.736	0.462
HEF* disclosure	*−0.368 (0.162)*	*−2.275*	*0.024*	−0.134 (0.182)	−0.736	0.462
CEF* disclosure* country	0.045 (0.121)	0.368	0.713	−0.106 (0.138)	−0.771	0.441
HEF* disclosure* country	0.114 (0.322)	0.352	0.724	*−0.983 (0.363)*	*−2.711*	*0.007*
CEF* country	0.015 (0.061)	0.251	0.802	−0.026 (0.069)	−0.375	0.708
HEF* country	0.017 (0.161)	0.103	0.918	0.170 (0.181)	0.939	0.348
Disclosure* country	*0.488 (0.244)*	*2.004*	*0.046*	0.122 (0.277)	0.441	0.660

Notes: Scores represent unstandardized b-coefficients with standard errors between parentheses. CEF= Cool EF; HEF = Hot EF; Significant effects are in *italic* (at $p < 0.05$). Model 13 in PROCESS was used and all effects control for gender and channel viewing frequency
Source: Authors' own work

Table 2 Main and interaction effects on brand and video responses

	Brand recall			*Purchase intention*			*Brand attitude*			*Video attitude*		
	b (SE)	*t*	*p*	*b* (SE)	*t*	*p*	*b* (SE)	*t*	*p*	*b* (SE)	*t*	*p*
CEF	0.100 (0.069)	1.440	0.150	0.024 (0.048)	0.509	0.611	0.007 (0.029)	0.223	0.824	0.026 (0.038)	0.684	0.494
HEF	*0.488 (0.181)*	*2.694*	*0.007*	−0.207 (0.126)	−1.639	0.102	−0.096 (0.077)	−1.242	0.215	−0.075 (0.100)	−0.748	0.455
CEF*Country	−0.025 (0.136)	−0.186	0.853	0.005 (0.093)	0.052	0.958	0.081 (0.057)	1.417	0.157	0.101 (0.073)	1.383	0.168
HEF*Country	0.664 (0.356)	−1.865	0.062	−0.018 (0.248)	−0.074	0.941	0.094 (0.151)	0.623	0.534	0.030 (0.196)	0.154	0.053

Notes: Scores represent unstandardized b-coefficients with standard errors between parentheses. Significant effects are in *italic* (at $p < 0.05$). CEF is cold executive function, HEF is hot executive function. Model 13 in PROCESS was used and all effects control for gender and channel viewing frequency
Source: Authors' own work

persuasive intent, skepticism and brand and video responses. In the text, only significant effects are identified, all results can be found in the tables.

Regarding *H1*, the analyses showed a significant effect of CEF on understanding persuasive intent ($b = 0.07$, $SE = 0.03$, $p = 0.022$), but no direct effect on brand recall. This means that people with more advanced CEF showed a better understanding of the video's persuasive intent, but not higher brand recall. Thus, *H1a* is supported, but *H1b* is not. For *RQ1*, the analyses showed no significant effects of CEF on skepticism, purchase intention, brand attitude or video attitude (Table 2).

Regarding *H2*, there were no significant effects of HEF on skepticism, purchase intention, brand attitude or video attitude (see Table 2). Thus, *H2* was not supported. For *RQ2*, there was no effect of HEF on understanding intent, but there was a significant positive effect on brand recall ($b = 0.49$, $SE = 0.18$, $p = 0.007$) as more advanced CEF was associated with better understanding of the video's persuasive intent, and HEF was associated with higher brand recall.

As predicted in *H3*, analyses using Model 4 of PROCESS, showed a significant indirect effect of CEF on brand recall via understanding intent ($b = 0.04$, $SE = 0.02$, BCACI [0.005; 0.085]). People with more advanced CEF showed a better understanding of persuasive intent, which led to more brand recall. Thus, *H3* is supported. With respect to *RQ3*, there were no significant indirect effects of CEF on purchase intention, brand attitude or video attitude via understanding intent. For *H4* and *RQ4*, there were no indirect effects of HEF on the brand and videos responses via skepticism. For all indirect effects, see Table 3.

Table 3 Indirect effects of EF via understanding intent and skepticism on brand and video responses

	Cool EF				*Hot EF*			
	Via understanding intent		*Via skepticism*		*Via understanding intent*		*Via skepticism*	
	b (SE)	*CI*	*b (SE)*	*CI*	*b (SE)*	*CI*	*b (SE)*	*CI*
Brand recall	*0.040 (0.020)*	*0.005;0.085*	0.007 (0.008)	−0.005;0.027	0.031 (0.053)	−0.070;0.141	0.005 (0.020)	−0.034;0.049
Purchase intention	0.001 (0.006)	−0.010;0.014	−0.018 (0.013)	−0.047;0.006	0.001 (0.008)	−0.011;0.021	−0.012 (0.037)	−0.085;0.062
Brand attitude	0.003 (0.004)	−0.003;0.012	−0.015 (0.010)	−0.036;0.004	0.002 (0.006)	−0.009;0.018	−0.009 (0.031)	−0.073;0.049
Video attitude	0.002 (0.005)	−0.008;0.011	−0.023 (0.016)	−0.055;0.007	0.002 (0.006)	−0.008;0.019	−0.015 (0.047)	−0.102;0.083

Notes: Scores represent unstandardized b-coefficients with standard errors between parentheses; CI is the bias corrected accelerated confidence interval with the lower limit; upper limit. Significant effects are in *italic* (at $p < 0.05$). Model 4 in PROCESS was used with gender, channel viewing frequency, disclosure condition, and country controlled for
Source: Authors' own work

Moderation effects of disclosure

Regarding *H5* and *RQ5*, the analyses showed no significant moderation effect of disclosure on CEF and understanding intent (Table 4), or the relationship between CEF and skepticism. Regarding *H6*, disclosure did not moderate the relationship between HEF and skepticism. Thus, *H5* and *H6* are not supported. However, regarding *RQ6*, the relation between HEF and understanding intent was moderated by the presence of a disclosure ($b = -0.37$, $SE = 0.16$, $t = -2.28$, $p = 0.024$). Figure 1 shows that a disclosure enhances the understanding of persuasive intent for people with less advanced HEF; however, for people with more advanced HEF the disclosure has no effect.

Moderated mediation effects

For *RQ7* and *RQ8*, the analyses showed no significant moderated mediation effects of CEF or HEF and disclosure via understanding intent or skepticism, except for the effect of HEF via understanding intent on brand recall, see Tables 4 and 5. As shown previously, disclosures enhanced the understanding of persuasive intent for people with less advanced HEF which consequently leads to higher brand recall ($b = 0.63$, $SE = 0.12$, $z = 5.23$, $p < 0.001$), whereas the disclosure had no effects for people with more advanced HEF.

Country effects

Regarding the role of country (*RQ9*), the analyses showed that the effects of CEF and HEF on understanding intent and skepticism were not moderated by country, see Table 1. The direct effects of CEF and HEF on brand recall, purchase intention, brand attitude and video attitude, were also not moderated by country, see Table 4.

However, a significant interaction emerged between country and disclosure on understanding intent (Table 1). As Figure 2 shows, disclosure does not affect persuasion understanding among American participants, but for Dutch participants, the disclosure leads to significantly better understanding of the video's persuasive intent compared to the control condition.

There is no significant three-way interaction between CEF, disclosure and country on understanding intent (Table 1). There is a significant three-way interaction between HEF, disclosure and country on skepticism ($b = -0.98$, $SE = 0.36$, $t = -2.71$, $p = 0.007$). As Figure 3 shows, for the Dutch sample, HEF is positively related to skepticism without a disclosure ($b = 0.42$, $SE = 0.17$, $t = 2.54$, $p = 0.011$), but with a disclosure, skepticism is the same regardless of HEF ($b = -0.21$, $SE = 0.16$, $t = -1.33$, $p = 0.185$). For the American sample, both with ($b = -0.24$, $SE = 0.21$, $t = -1.17$, $p = 0.243$) and without a disclosure ($b = 0.11$, $SE = 0.19$, $t = 0.56$, $p = 0.579$), there was no significant effect of HEF on skepticism.

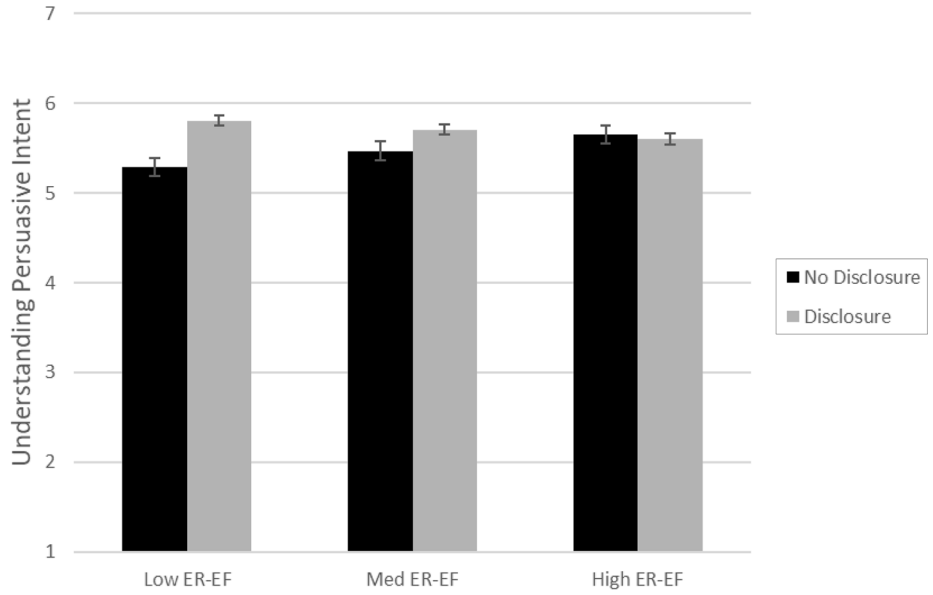
Table 4 Moderated mediation effects of cool EF on brand and video responses

	Via understanding intent			*Via skepticism*		
	CEF disclosure*	*CEF* disclosure* country*	*CEF* country*	*CEF* disclosure*	*CEF* disclosure* country*	*CEF* country*
Brand recall	−0.001 (0.034) [−0.066;0.070]	−0.014 (0.025) [−0.075;0.030]	0.011 (0.037) [−0.062;0.087]	−0.006 (0.011) [−0.034;0.012]	0.027 (0.078) [−0.120;0.194]	−0.005 (0.013) [−0.038;0.017]
Purchase intention	0.000 (0.004) [−0.009;0.009]	0.001 (0.010) [−0.021;0.023]	0.000 (0.005) [−0.010;0.011]	0.018 (0.021) [−0.023;0.061]	0.038 (0.050) [−0.059;0.141]	0.012 (0.026) [−0.039;0.064]
Brand attitude	0.000 (0.003) [−0.007;0.007]	0.002 (0.008) [−0.013;0.022]	0.001 (0.004) [−0.008;0.009]	0.015 (0.017) [−0.018;0.049]	0.031 (0.040) [−0.044;0.133]	0.011 (0.023) [−0.033;0.056]
Video attitude	0.000 (0.003) [−0.007;0.007]	0.001 (0.008) [−0.017;0.020]	0.000 (0.004) [−0.008;0.010]	0.023 (0.027) [−0.029;0.078]	0.049 (0.065) [−0.074;0.182]	0.016 (0.034) [−0.008;0.010]

Notes: Scores represent Index of Moderated Mediation with standard errors between parentheses. CEF = Cool EF; CI = 95% bootstrap confidence interval. Model 7 in PROCESS was used with gender and channel viewing frequency controlled for in all models. For the two-way interactions, the non-included factor was also controlled for

Source: Authors' own work

Figure 1 Interaction effect of disclosure and hot EF on understanding persuasive intent



Source: Authors' own work

This interaction effect also resulted in a significant moderated mediation effect for HEF via skepticism on brand attitude (index of moderated mediation = 0.29, *SE* = 0.12, [0.06; 0.55]), purchase intention, (index of moderated mediation = 0.35, *SE* = 0.16, [0.08; 0.70]), and video attitude (index of moderated mediation = 0.45, *SE* = 0.19, [0.10; 0.84]), see Table 5. The indirect effects were only significant for participants from The Netherlands without a disclosure (for brand attitude: index of moderated mediation = −0.13, *SE* = 0.06, [−0.25; −0.02], for purchase intention: index of moderated mediation = −0.15, *SE* = 0.07, [−0.30; −0.02], for video attitude: index of moderated mediation = −0.20, *SE* = 0.09, [−0.36; −0.03]. Dutch participants with more advanced HEF, without a disclosure, showed higher skepticism which resulted in more negative brand attitudes, video attitudes and lower purchase intention. For Dutch people who did see a disclosure or for Americans (regardless of disclosure), there were no significant moderated mediation effects between HEF and disclosure. Also, the mediated effects were not moderated by the interaction between CEF, country and disclosure (Table 4).

Discussion

Understanding how young people navigate changes to the advertising landscape is one of the key issues facing scholars in this area, including identifying mechanisms to protect these consumers (e.g. Wojdynski and Evans, 2020; Ianelli Rocha *et al.*, 2023). To that end, this study amongst young adults from The Netherlands and USA examined whether EF skills aid them in recognizing the persuasive intent and increasing advertising skepticism when faced with sponsored videos. Moreover, we explored whether the presence of an advertising disclosure differentially affected participants' responses to this persuasive message and if there were differences between Dutch and American participants. As such, the current study highlights two vital areas of inquiry: how do cognitive and affective processing affect young consumers across development and how might cross-cultural differences be implicated in this area.

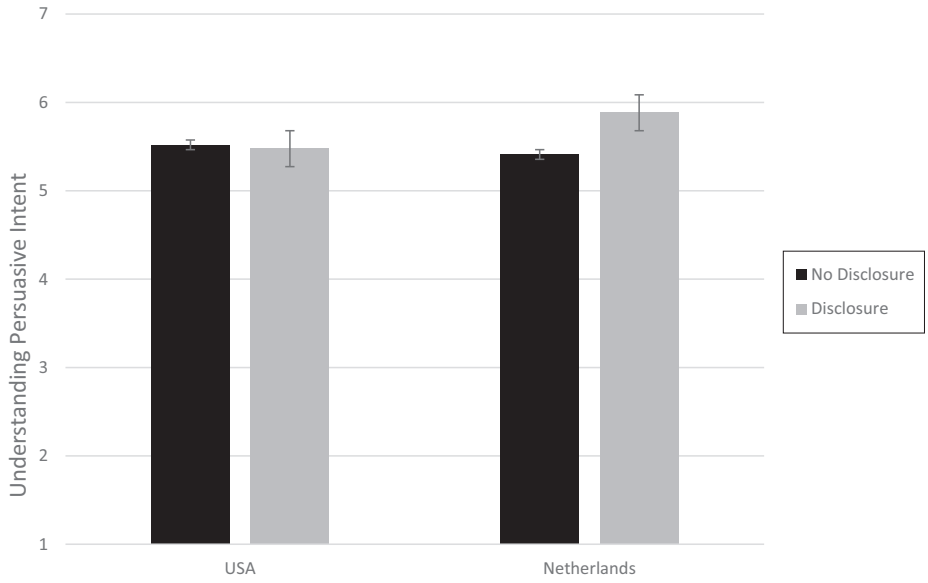
Table 5 Moderated mediation effects of hot EF on brand and video responses

	Via understanding intent			*Via skepticism*		
	HEF disclosure*	*HEF* disclosure* country*	*HEF* Country*	*HEF* disclosure*	*HEF* disclosure* country*	*HEF* country*
Brand recall	*−0.238 (0.112) [−0.484; −0.045]*	0.073 (0.227) [−0.357;0.547]	0.026 (0.108) [−0.197;0.238]	−0.031 (0.041) [−0.126;0.037]	−0.137 (0.126) [−0.426;0.070]	0.026 (0.043) [−0.052;0.128]
Purchase intention	−0.009(0.031) [−0.077;0.053]	0.003 (0.030) [−0.051;0.075]	0.001 (0.014) [−0.028;0.035]	0.087 (0.078) [−0.046;0.263]	*0.351 (0.161) [0.081;0.704]*	−0.054 (0.075) [−0.209;0.087]
Brand attitude	−0.018 (0.020) [−0.062;0.017]	0.005 (0.023) [−0.038;0.059]	0.002 (0.011) [−0.018;0.031]	0.071 (0.061) [−0.039;0.201]	*0.289 (0.123) [0.063;0.545]*	−0.050 (0.067) [−0.180;0.085]
Video attitude	−0.013 (0.025) [−0.070;0.033]	0.004 (0.025) [−0.037;0.072]	0.001 (0.011) [−0.262;0.124]	0.112 (0.094) [−0.069;0.301]	*0.454 (0.189) [0.096;0.836]*	−0.072 (0.097) [−0.262;0.124]

Notes: Scores represent Index of Moderated Mediation with standard errors between parentheses. HEF = Hot EF; CI = 95% bootstrap confidence interval. Significant effects are in *italic*. Model 7 in PROCESS was used with gender and channel viewing frequency controlled for in all models. For the two-way interactions, the non-included factor was also controlled for

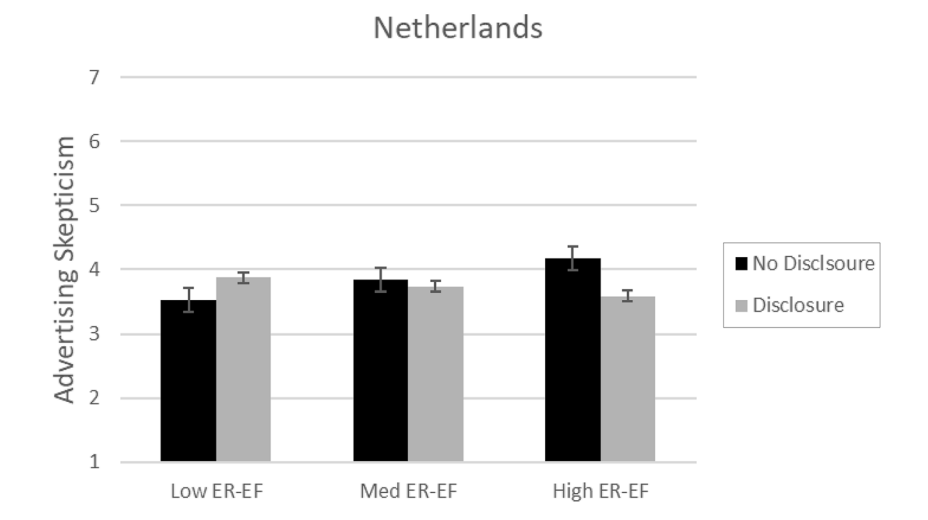
Source: Authors' own work

Figure 2 Interaction effect between disclosure and country on understanding intent



Source: Authors' own work

Figure 3 Interaction effects between hot EF and disclosure on skepticism for The Netherlands



Source: Authors' own work

The results from this study provide several key insights. First, we find that responses to sponsored videos are influenced by both HEF and CEF. Specifically, we find that EF is associated with cognitive responses: participants with more advanced CEF showed a better understanding of the video's persuasive intent and HEF was associated with higher brand recall. These findings add to the literature that, so far, only focused on the relation between EF and persuasion among children (e.g. Lapierre, 2019; Lapierre and Rozendaal,

2019). The present study is the first to show that both HEF and CEF are related to persuasion knowledge and persuasion associated outcomes among young adults.

Second, we find some relevant interactions between EF and disclosures. Specifically, results suggest that disclosures enhance understanding of persuasive intent for people with less advanced HEF which consequently leads to higher brand recall, while there was no effect for more advanced HEF. Previous studies showed that disclosures enhanced people's understanding of persuasive intent of sponsored content (Eisend *et al.*, 2020), but our study adds to the literature as we show that these effects do not hold for all.

Third, we find key differences between the Dutch and American samples. The first of these differences revealed that disclosures do not affect the understanding of persuasive intent among American participants; however, for Dutch participants, disclosures helped them identify the persuasive nature of the video. In addition, the results revealed that only Dutch participants with more advanced HEF and who did not see a disclosure, were significantly more skeptical toward the sponsored content in the video, which resulted in more negative brand attitudes, video attitudes and lower purchase intention. This finding not only highlights a key difference between the participants residing in these two countries, but it also reveals that in situations where an advertising disclosure is not present, more advanced HEF can affect brand assessments and consumer behavior. This relationship has been theorized with children (Rozendaal *et al.*, 2011) with subsequent empirical findings providing support for a closely related construct (emotion regulation; Lapierre, 2016; Lapierre and Rozendaal, 2019), but the current study shows that these same cognitive/affective variables play a similar role for young adults.

These results also present some questions regarding why certain findings did not materialize. First, one question that remains is why these findings only materialized for Dutch participants. Previous research indicates that there are differences in consumer socialization/attitudes toward advertising between the two countries (Lapierre and Rozendaal, 2018; van der Goot *et al.*, 2018). Specifically, as Lapierre and Rozendaal note, these differences are likely driven by the fact that young people in the USA grow up in an environment that is much more commercially oriented with fewer policies in place to regulate advertising (e.g. schools in the US routinely feature advertising while this is virtually unheard of in The Netherlands). As such, young people in The Netherlands likely grow up with a more guarded attitude toward persuasive messaging.

Second, although these findings did show that both HEF and CEF are linked with persuasion processing among young adults, there were also consistent null findings for these variables and attitudinal outcomes as EF did not significant predict brand or video attitudes. This suggests improved EF among young adults does not bleed into affective decision-making and/or assessments of the product/influencer which is contrary to what has been predicted in previous theorizing (e.g. Rozendaal *et al.*, 2011) and suggests that these cognitively associated constructs are not linked with attitudinal literacy which has significant implications for how researchers in this area think about various types of advertising literacy.

Theoretical and practical implications

Our study provides some important theoretical insights related to EF and disclosures. First, our study shows that the effects of EF on persuasion processing extend beyond childhood which provides opportunities for further theoretical refinements. For persuasion processing theories to expand on their explanatory power, it is vital for researchers to tell a coherent story of how young message processors become adult message processors.

Second, this is the first study that has looked at both CEF and HEF within a persuasion context and may likely be the first study that has included these constructs in a communication context. Research from cognitive psychology has shown that cognitive processing has both affective and non-affective components (Zelazo and Carlson, 2012) and

seeing that these variables have something to contribute for persuasion suggests that theory within our discipline should incorporate these differing conceptualizations of cognition.

Our study also offers important new insights into the boundary conditions of disclosure effects. Specifically, disclosures do not work in a "one size fits all" framework; rather, some groups likely benefit while others do not. Our findings suggest that people with less advanced EF, particularly HEF, are more likely to benefit from these message cues. In a global sense, theorizing in this area would likely benefit from including perspectives which argue for the importance of individual differences in media/message processing (see Valkenburg and Peter, 2013).

The last of the theoretical implications centers on the country differences. Much of the research done in this area has been focused within countries (Boerman and van Reijmersdal, 2016); yet there are clear differences between countries. Our study offers evidence that participants raised in different countries respond differently to disclosures, as American participants' understanding of persuasive intent was not affected by the disclosure but the same was not true for Dutch participants. Moreover, HEF was more impactful for the participants from The Netherlands on affective outcomes compared to their American counterparts. There should be greater attention paid to potential cross-national differences when generating theory.

Regarding the practical implications, this study offers important insights for lawmakers regarding how vulnerable populations may need to be protected concerning persuasion via sponsored content. Our study provides evidence that disclosures are potentially necessary for those individuals who may be lacking the cognitive skills to recognize the persuasive nature of sponsored messages on their own with a focus on making these disclosures more noticeable. This may be especially relevant for the protection of younger audiences as they are less likely to have advanced EF capabilities (Zelazo and Carlson, 2012). This is certainly relevant in the USA, as disclosures had no apparent influence on persuasion understanding for the young adults in our sample which suggests that more should be done for young consumers residing in this country (e.g. educational programs dedicated to advertising literacy).

Limitations and future research

This study focused on YouTube as a popular platform among young adults that features a lot of sponsored content. Based on their levels of EF, young adults may respond to the audiovisual content on YouTube in a different manner than less demanding visual-only content on other platforms such as Instagram. Future research is needed to see whether the effects found here, hold across platforms and for sponsored content with other modalities (visual or audio only).

Second, the video used in this study was of an entertaining nature. Future research should explore whether more informative or educational sponsored content leads to different effects. It might be that such content is watched with more focus and attention even among people with less advanced EF.

Finally, with this sample comprised of college students, it is important for future research to generalize these findings to non-college populations. That noted, there is evidence to indicate that this sample was not markedly different from a more diverse sample of adults. Specifically, when looking at previous research using the same measure that we used for CEF but with a diverse adult sample, there was no difference in performance on this measure ($M = 2.8$ vs $M = 2.5$; Sirota and Juanchich, 2018).

Conclusion

Globally, young consumers are turning to alternative forms of entertainment where advertising content is often embedded in this content. Consequently, understanding their

ability to identify and comprehend commercial promotions is paramount. Our study provides key insights regarding how cognitive ability can help these consumers face these challenges via EF. Moreover, when considering the differences between Dutch and American young adults and how they respond these promotional techniques, our study shows that the socialization of consumers is vital.

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Supplementary material

The supplementary material for this article can be found online.

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