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Journal of Experimental Social Psychology 42 (2006) 397–405
Journal of Experimental Social Psychology
www.elsevier.com/locate/jesp

Hardly thinking about others: On cognitive busyness and target similarity in social comparison effects ☆

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Received 2 February 2004; revised 4 May 2005
Available online 5 August 2005

Abstract

Two studies were undertaken to investigate the impact of other-self si[illegible] on the outco[illegible] of social comparison effects when people are cognitively busy versus non-busy. Results demonstrate th[illegible] when perceivers are able to devote sufficient cognitive resources to the comparison process, extremely similar others lead to as[illegible]ilative self[illegible]luations, whereas moderately similar others lead to contrastive self-evaluations and dissimilar others lead to null e[illegible]ts. When [illegible]ceivers are cognitively busy, however, both extremely and moderately similar others yield assimilation effects, whereas [illegible]imila[illegible]hers yield contrast effects.

Keywords: Social comparison; Self; Similarity; Cognitive busyness; C[illegible]rast[illegible]on

Social comparisons are prima[illegible]ly [illegible] knowledge about the self by relati[illegible] emotio[illegible] thoughts, and behaviors to those arou[illegible] (see Blan[illegible]2000; Wood, 1989). Indeed, over t[illegible]50 [illegible]s since Festinger's seminal paper on social [illegible]mparison [illegible]ory (Festinger, 1954) countless experi[illegible]nts have been c[illegible]ucted on the outcomes of the co[illegible]arison [illegible]ocess. These experiments have shown that so[illegible]c[illegible]parison can lead to contrast (I feel stupid [illegible]cause [illegible]colleag[illegible] is an excellent chess player), as[illegible]n (I fe[illegible] because my sister won the Puli[illegible] prize[illegible]s well as [illegible]ull effects (I do not feel less attracti[illegible]he[illegible] Cindy Crawford because she is a pro[illegible]nal model and I am a psychologist). Reviews of the relevant literature have identified a number of moderators of whether social comparisons yield contrast or assimilation (for reviews see e.g., Mussweiler & Strack, 2000; Stapel & Suls, 2004).

Interestingly, even though studies on the self-evaluative consequences of social comparisons abound, the vast majority of these studies have focused on the impact of social comparisons in situations that allow for relatively mindful and effortful processing (see Markman & McMullen, 2003; Suls & Wheeler, 2000; Taylor & Lobel, 1989). Only recently have studies been published that explicitly investigate and compare more versus less controllable social comparison effects (e.g., Gilbert, Giesler, & Morris, 1995; Pelham & Wachsmuth, 1995; Stapel & Blanton, 2004). Hence, we do not know much about the possible similarities and differences between social comparisons that are made when people *think hard* versus when people (can) *hardly think* about the social comparison information. Some have argued that when people are cognitively busy, assimilation is more likely (e.g., Pelham & Wachsmuth, 1995), whereas others have shown that contrast is more likely in such situations (e.g.,

☆ The research and writing was supported in part by a "Pionier" grant from the Dutch Science Foundation (Nederlandse Organisatie voor Wetenschappelijk Onderzoek) and a research grant from the Heymans Institute of the University of Groningen, awarded to the first author.
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0022-1031/$ - see front matter © 2005 Elsevier Inc. All rights reserved.
doi:10.1016/j.jesp.2005.05.006

Gilbert et al., 1995). Thus, the aim of the current research is to highlight the conditions under which thinking hard versus hardly thinking will lead to assimilation, contrast, or no effect.

Thesis

The notion that assimilation occurs when people hardly think is nicely illustrated by the following quote from Pelham and Wachsmuth (1995): "whenever people lack the motivation or cognitive resources required to make explicit comparisons between two stimuli, assimilation processes will serve as a default processing strategy" (p. 825). In support of this line of reasoning, Pelham and Wachsmuth (1995) presented a series of studies in which they found that social comparisons with participants' roommates and friends (i.e., similar others) yielded contrast for participants who were uncertain of their self-views and assimilation for participants who were certain of their self-views. They explained these effects in terms of depth of processing. Namely, participants with uncertain self-views were motivated to engage in thoughtful processing because they wanted to figure out who they are and where they stand. Put another way, these participants were motivated to engage in reflective, explicit comparisons in which the other person is used as a standard against which the self is judged" (Pelham & Wachsmuth, 1995, p. 826). People with *certain* self-views, however, should process social comparison information more heuristically. They know who they are and where they stand and thus have no need for comparison information. This heuristic processing should typically produce assimilation because most people start with the assumption that they are similar to other people, especially when those other people are relatively similar, such as roommates or friends (Pelham & Wachsmuth, 1995).

Antithesis

The opposing notion that contrast, rather than assimilation, occurs when people hardly think is nicely captured by the following quote from Wedell (1994) "contrast effects in both the perceptual and cognitive domains often happen early in mental processing, require minimal resources, and are therefore beyond the participant's control" (p. 1007). Gilbert et al. (1995) conducted two studies that support this perspective. In each of these studies, they examined participants' self-evaluations after they performed a "schizophrenia detection" task and were shown a videotape of a confederate (i.e., a stranger they had never seen before) performing the same task. The results showed that when the confederate's performance was *irrelevant* and either high (i.e., the confederate had been given the right answers) or low (i.e., the confederate was purposely misled), contrast occurred when participants were cognitively busy (when they were rehearsing an 8-digit number). No effects were found when participants were not cognitively busy. Thus, Gilbert et al. (1995) concluded that irrelevant social comparisons might not always show their impact when people have sufficient mental resources. Null effects may sometimes be *corrected* contrast effects.

Synthesis

The juxtaposition of the positions put forward by Pelham and Wachsmuth (1995) and Gilbert et al. (1995) leads to an interesting question: What are the self-evaluative consequences of social comparison information when this information is processed relatively superficially? That is, under what conditions do assimilation (see Pelham & Wachsmuth, 1995) or contrast (Gilbert et al., 1995) effects primarily occur? One answer to this question seems to reveal itself upon closer examination of the research conducted by Pelham and Wachsmuth and Gilbert et al. As the attentive reader may have noticed, Pelham and Wachsmuth used roommates and friends as comparison targets, whereas Gilbert et al. used a virtual stranger. Thus, it appears that target similarity may be an important determinant of the outcome of *thinking hard* versus *hardly thinking* about social comparisons. In the present studies we investigated this hypothesis by examining the effects of cognitive busyness and target similarity on the self-evaluative consequences of social comparisons.

Target Similarity

Of course, the notion that target similarity is an important determinant of social comparison effects can hardly be called new (see Festinger, 1954, pp. 120–121). That is, although to date there have been no systematic investigations of the role of target similarity when it comes to determining the outcome of social comparison effects under cognitive load or no load, the available evidence suggests at least two things. First, there is evidence showing that target similarity is an important indicator of whether social comparisons exert an effect at all. Second, there is evidence showing that target similarity can determine whether social comparison results in assimilation or contrast. The first notion—similarity is a precondition for the occurrence of social comparison effects—constitutes one of the "fundamental truths" (Gilbert et al., 1995, p. 227) of classic social comparison research: No similarity, no effect (see Festinger, 1954; Goethals & Darley, 1977; McFarland, Buchler, & Mackay, 2001). Hence, a professor may feel relatively

deprived when hearing that her colleague (a similar, close other) earns much more, but such contrast effects are less likely when the comparison target is a famous movie star (a dissimilar, distant other).

There is research, however, suggesting that target similarity may not only determine the occurrence, but also the direction of social comparison effects (for a review, see Stapel & Marx, 2005). These studies suggest that when there is sufficient similarity for social comparison effects to occur, the amount or type of target-self similarity may determine whether (a) the target information will be included in people's representation of the standard they use to compare themselves, with contrast as the typical result ("compared to him, I am quite successful"), (b) the target information will be included in people's self representation, with assimilation as the typical result ("Just like her, I am quite successful). The available evidence suggests that target information is more likely to be included in representations of the standard when target-self similarity is moderate or normal (e.g., target and self like peanut butter), whereas inclusion in self-representations is more likely when target-self similarity is extreme or unique, (e.g., target and self like Skippy, extra-crunchy honey-roasted peanut butter and banana sandwiches) (see Brewer & Weber, 1994; Brown, Novick, Lord, & Richards, 199[illegible] Gardner, Gabriel, & Hochschild, 2002; Marx, Stapel, Muller, 2005; Miller, Turnbull, & McFarland, 198[illegible] Spears, Gordijn, Stapel, & Dijksterhuis, 2004; Stapel & Koomen, 2001).

Thus, the role of similarity in the [illegible]come [illegible] self-evaluative social comparisons is perhap[illegible]st ized as follows: Target similarity [illegible] a pre[illegible]dition for social comparison effects to oc[illegible] Dissimilar [illegible]gets are perceived as irrelevant and b[illegible]e [illegible]not affect [illegible]-evaluations. Similar targets a[illegible] more like[illegible] exert self-evaluation effects: Moder[illegible]y similar targ[illegible] are likely to lead to contrast; ex[illegible]nely [illegible]ilar targets are likely to lead to assimilation.

Cognitiv[illegible]synes[illegible]nd targ[illegible]milarity

In the [illegible]t studies, we investigated the impact of target simila[illegible] on the self-evaluative consequences of social comparis[illegible] information when people *do* versus *do not* have the mental resources to think deeply about this information. As Gilbert et al.'s (1995) findings imply, when people are cognitively busy, whether or not target information is comparison relevant plays less of role in the outcome of social comparison effects than when people are not cognitively taxed. Only when mental resources are plentiful are dissimilar targets seen as irrelevant and therefore do not affect self-evaluations. This suggests that cognitive resources are important for determining target relevance.

Consistent with this reasoning, when people are cognitively busy, target similarity should not affect the perceived relevance of social comparisons. Instead, we propose that target similarity should have a *direct*, heuristic effect on the self-evaluative consequences of social comparison, such that (both moderately and extremely) similar others will yield assimilation and dissimilar others will yield contrast. As many theorists of perception have suggested, people routinely overstress the similarity of stimuli when the stimuli are memb[illegible]the same category as well as overemphasize t[illegible]differe[illegible] between stimuli when the stimuli are me[illegible]rs of differ[illegible] categories (Gentner & Markman, 1997; [illegible]ssweiler [illegible] Strack, 2000; Sherif & Hovland[illegible]961). T[illegible] pe[illegible]e's first, superficial reaction to i[illegible]rmati[illegible]n abo[illegible]*milar* other might be "we are alik[illegible] Con[illegible]sely, people's first, superficial reaction to [illegible]form[illegible]n abo[illegible] dissimilar other might be "we [illegible] different."

In sum, [illegible] that the e[illegible]t of target similarity on the outcome of [illegible]al comparisons depends on the amou[illegible]f cognitive [illegible]rt perceivers put into the compa[illegible]n process. When [illegible]erceivers can devote adequate c[illegible]itive reso[illegible]ces to the social comparison process, th[illegible] will reco[illegible]ze that dissimilar target others make irre[illegible]nt co[illegible]rison standards. Thus, in this case, dissimila[illegible] should yield no self-evaluation effects, [illegible]derately similar others should yield contrastive com-[illegible] effects, and extremely similar other should yield [illegible]ssimilation effects. When perceivers are cognitively busy, however, perceivers are likely to be unable to contemplate the irrelevant dissimilar comparison targets. In such situations, target similarity will feed directly to self-evaluations, such that dissimilar others yield contrast, and (moderately and extremely) similar others yield assimilation. We tested these predictions in two studies.

Study 1

In the first study, we tested our conjecture that the discrepancy between the Pelham and Wachsmuth (1995) and Gilbert et al. (1995) findings could be explained in terms of target similarity. Put differently, we tested the hypothesis that target similarity and cognitive busyness are important weights that make the social comparison pendulum swing toward either assimilative or contrastive self-evaluations. More specifically, we predicted that the impact of target similarity on the outcome of social comparisons depends on the amount of cognitive effort perceivers put into the comparison process.

Method

Participants and design

Participants were 185 psychology students who took part for course credit or pay. For this study we used a

2 (Target Similarity: similar, dissimilar) × 2 (Cognitive Busyness: present, absent) × 2 (Target Performance: good, bad) between-participants design.

Procedure and materials

On arrival at the testing room participants were told that they would be involved in a series of studies. They were then informed that the experimenter would time them while they completed each of these studies. First, participants read a one-page popular science article describing studies on "how and why similarities attract". Their task was to guess in which daily newspaper or weekly magazine the article could have been published. The article described a large number of (bogus) surveys and experimental studies that had purportedly shown that psychology students were very similar. The article concluded with the "statistic" that there are more "psychology marriages" than there are marriages between students from other majors. The goal of this fictitious article was to increase the idea that psychology students (and thus our participants) are similar to each other.

After having read the newspaper article and having written down their answers to the media source question, participants were told that they would be given an 18-item general knowledge test that was designed to assess their *general reasoning* and *intuitive thinking ability*. The test was described as an important tool used in personnel selection batteries, useful for predicting important abilities, and as a test that correlates surprisingly well with interpersonal skills. All participants were given information about another person's score on the test.

In the similar target conditions, this other person was a same-sex psychology student. Participants were told that this student was very much like other psychology students with respect to personality and preferences and general intelligence. In the distant target conditions, this other person was an opposite-sex law student and participants were told that this student was very much like other law students with respect to personality and preferences and general intelligence and thus "very different from the typical psychology student". In essence, this law student was a virtual stranger to the participants (much like the confederate/target in the Gilbert et al. studies).

Participants in the good performance condition read that the comparison target had given correct responses on 16 of the 18 items. Participants in the bad performance condition read that the comparison target had given correct responses on 4 of the 18 items.

Participants in the cognitively busy conditions were told that to discover how concentration affected performance on the general knowledge test, they would perform the test while rehearsing an 8-digit number. Subsequently, these participants were shown an 8-digit-number and were told to keep this number in mind throughout the test and to be prepared to report the number when the test was finished. Participants in the non-busy conditions were not given a number to rehearse. It is important to note that participants in the cognitively busy condition (but not in the non-busy condition) were told that the comparison target had also performed the test while rehearsing an 8-digit number. This was done so that busy participants would not conclude that their own score differed from the comparison target's score because they had performed the test under difficult conditions (see also Gilbert et al., 1995).

Next, all participants performed the general knowledge test. This test consisted of 18 items, which included questions adapted from the game Trivial Pursuit, analytical reasoning and spatial ability questions taken from general IQ tests, and questions drawn from the Remote Associates Tasks that have been used in previous social comparison research (see Stapel & Koomen, 2000, 2001). All participants were told that they would receive a relatively difficult version of the test. In fact, for most of the 18 items there was no clear, true answer. After they finished the test participants handed it to the experimenter who ostensibly left the room to grade the test. Approximately two minutes later, the experimenter returned. All participants were given feedback indicating that they had given correct responses on 10 of the 18 items. Then, the participants completed the dependent measures.

To begin, participants were asked to estimate their general reasoning and intuitive thinking abilities on a 100-point scale ranging from 1 (*very bad*) to 100 (*very good*). After that, participants were asked to recall their own and the comparison target's score on the knowledge test and were asked to recall the comparison target's major. Then they were asked to indicate to what extent they felt close to the comparison target on a 9-point scale ranging from 1 (*not at all close*) to 9 (*very close*). Afterwards, participants were asked to indicate, on a 7-point scale ranging from 1 (*not at all relevant*) to 7 (*very relevant*), the extent to which they felt the comparison target's score was relevant for their self-assessments. Finally, busy participants were asked to write down the number they had been rehearsing.

Upon completion of the questionnaire, participants were probed for suspicion. None of the participants spontaneously indicated suspicion of the actual goal of the study or indicated that their self-evaluations might have been influenced by the comparison target or the busyness manipulation. After debriefing, participants were thanked and dismissed.

Results

Manipulation checks

First, we checked whether we had to exclude participants because they had misremembered the comparison target's score or their own score. In addition, for busy

participants we checked whether they were able to write down the 8-digit number that they were told to rehearse. None of the participants failed these checks and thus all were included in the analyses. Finally, we conducted manipulation checks on the participants' closeness and relevance scores to examine whether participants judged the similar comparison target as closer than the dissimilar comparison target, as well as whether participants judged the similar target as more relevant to their self-assessments than the dissimilar target.

The participants' closeness scores were analyzed using a Target Similarity × Cognitive Busyness × Target Performance Analysis of Variance (ANOVA). Results revealed the predicted main effect of target similarity, $F(1,177) = 163.22$, $p < .01$, $\eta = .69$ (Other Fs < 1.00). Participants judged the similar target ($M = 6.56$, $SD = 1.21$) as closer to them than the dissimilar target ($M = 4.15$, $SD = 1.32$).

The participants' relevance scores were investigated using a Target Similarity × Cognitive Busyness × Target Performance ANOVA. We found a main effect of Target Similarity, $F(1,177) = 17.48$, $p < .01$, $\eta = .30$, and the predicted Target Similarity × Cognitive Busyness interaction, $F(1,177) = 11.83$, $p < .01$, $\eta = .25$ (Other effects, ps > .11). Further analyses revealed, as expected, non-busy participants felt that comparison with the simi target ($M = 4.28$, $SD = 0.99$) was more relevant for th self-assessments than comparison with the dissimilar ta get ($M = 3.02$, $SD = 1.25$),, $F(1,177) = 29.35$, $p < .01$, $\eta = .38$. In contrast, cognitively busy parti judgment of the similar target's relev e (M 3.45, $SD = 1.00$) and the distant target's rele ce ($SD = 1.19$) did not differ ($F < 1.00$).

Taken together, these two m pulation c s show that perceived closeness wit e parison ta t was unaffected by the busyne manipula indicating that regardless of whether p icipants were y or not, they still judged the simil other closer than the dissimilar other. Relevance affe d, however, such that only for non-busy partici was t similar target perceived as re to the lf essments compared to the dissi ar ta t. Hen t is quite clear that our manip ions similarity were not only effective in creati gs of seness, they also show that cognitive busyn is an important factor in determining whether the target is perceived as relevant for participants' self-assessments.

Main analyses

The participants' self-perceived competence scores were investigated by performing a Target Similarity × Cognitive Busyness × Target Performance ANOVA. This analysis revealed a main effect of Target Performance, $F(1,177) = 11.22$, $p < .01$, $\eta = .24$, a Target Similarity × Cognitive Busyness inte F(1,177) = 10.23, $p < .01$, $\eta = .23$, a Target Si arity rget Performance interaction, $F(1,177$ 7.87, $p <$ $\eta = .21$, and the predicted three-w in ction, ,177) = 60.20, $p < .01$, $\eta = .50$ (Oth ffects, F 00).

As can be seen in ble 1 hese reflect, as expected, that in the bu conditions similar others yielded contrast here ssimila thers evoked no comparison e t. Specifi , n-busy participants rated then more po ely when they were exposed to a simi other who had performed poorly (M = 80.04, SD = 13. than when exposed to a similar oth who had perform d well ($M = 55.92$, $SD = 14.18$), F 177) = 26.32, $p < .01$, $\eta = .36$. This effect did not occur w non-bus participants were exposed to dissimilar oth That self-ratings of those participants who were to a high-performing dissimilar other (M = 68.57, $SD = 13.82$) did not reliably differ from those e exposed to a low-performing dissimilar other ($M = 71.91$, $SD = 21.54$), $F < 1.00$.

In the cognitive busyness conditions, however, similar others yielded assimilation and dissimilar others yielded contrast: Busy participants rated themselves more positively when they were exposed to a similar other who had performed well ($M = 81.26$, $SD = 12.32$) than when exposed to a similar other who had performed poorly ($M = 59.42$, $SD = 10.62$), $F(1,177) = 20.85$, $p < .01$, $\eta = .32$. This effect reversed when busy participants were exposed to dissimilar others. In this case, busy participants rated themselves less positively when they were exposed to a distant other who had performed well ($M = 57.57$, $SD = 15.74$) than when exposed to a distant other who had performed poorly ($M = 80.04$, $SD = 9.75$), $F(1,177) = 21.81$, $p < .01$, $\eta = .33$.

In sum, these results highlight our main contention regarding target similarity and cognitive busyness. When

Table 1
Mean (SD) self-perceived competence scores (1–100) as a function of cognitive load, target performance, and target similarity

	Cognitive load			
	Present		Absent	
Target performance:	Good	Bad	Good	Bad
Target similarity:				
Similar	81.26 (12.32)	59.42 (10.62)	55.92 (14.18)	80.04 (13.42)
Dissimilar	57.57 (15.74)	80.04 (9.75)	68.57 (13.82)	71.91 (21.54)

Note: Higher scores indicate greater self-perceived competence.

perceivers have limited cognitive resources their self-evaluations show assimilation when the target is similar and contrast when the target is dissimilar. But when the perceivers have more cognitive resources available, the similar target leads to contrast and the dissimilar target to no effect.

Study 2

In Study 2, we tested the robustness of the findings from Study 1. That is, we replicated Study 1's basic design in order to investigate the self-evaluative impact of moderately similar, and dissimilar comparison targets under conditions of cognitive busyness versus non-busyness. In addition to this replication, we also extended the basic design by adding an "extremely similar" level to the Target Similarity factor. Our prediction is that when similarity is extreme, when the target and the self are similar in a special way, such that there is a strong sense of "bondedness" (Gardner et al., 2002),"we-ness" (Marx et al., 2005; Stapel & Koomen, 2001), or "shared distinctiveness" (Brown et al., 1992), assimilation effects will be extra strong (see Stapel & Marx, 2005) and are likely to be independent of cognitive load.

Method

Participants and design

Participants were 202 psychology students who took part for course credit or pay. For this study we used a 3 (Target Similarity: extremely similar, moderately dissimilar) × 2 (Cognitive Busyness: present, absent) × 2 (Target Performance: good, poor) between participants design.

Procedure and materials

The procedure and materials used in this study were similar to the ones used in Study 1, except for the following differences. In the current study, before reading the popular science article, participants were asked to fill out a "Unique Preferences and Attitudes" questionnaire. In this questionnaire they were asked to indicate, on 9-point scales ranging from 1 (*not at all*) to 9 (*very much*), how much they enjoyed such things as "abstract modern art" and "spicy Indian dishes" and to indicate how much they agreed with statements like "The Iraq war is an unjust war," and "There is always some grain of truth in a stereotype."

After participants had completed this task, they handed the questionnaire to the experimenter, who then gave them the popular science article and the general knowledge test (see Study 1). After completion of the general knowledge test, participants were given the target information. In the moderately similar conditions and dissimilar conditions, this information was identical to the information given in Study 1, except that the dissimilar student was now an economics rather than a law student. In the extremely similar target conditions, participants were told that the target person was chosen to uniquely match their preferences and attitudes as indicated on the "Unique Preferences and Attitudes" questionnaire and that they were "almost identical" to this person when it concerned important preferences and attitudes (see McFarland et al., 2001). The target performance and cognitive busyness manipulations and dependent measures were nearly identical to those of Study 1. The only difference was that in order to measure participants' precise feelings of closeness we added a "special closeness" item on which participants had to indicate the extent to which they thought their personalities, attitudes, and preferences were similar to the target's. Ratings were made on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*).

Results

Manipulation checks

Just as in Study 1, none of the participants misremembered their own or the comparison target's score and none of the participants failed to write down the 8-digit number they were asked to remember. Next, we examined participants' feelings of closeness as well as the perceived relevance of the comparison target.

Similar to Study 1, a Target Similarity × Cognitive Busyness × Target Performance ANOVA on the "normal closeness measure" revealed a main effect of Target Similarity, $F(2,192) = 85.16$, $p < .01$, $\eta = .55$ (Other $ps > .24$). Participants judged the extremely similar target ($M = 6.46$, $SD = 0.92$) as somewhat closer to them than the moderately similar target ($M = 6.06$, $SD = 1.29$), $F(1,192) = 3.67$, $p < .06$, $\eta = .14$, and they judged both similar targets as closer to them than the dissimilar target ($M = 3.97$, $SD = 1.32$), $F(1,192) = 167.62$, $p < .01$, $\eta = .68$. An ANOVA on the "special closeness" measure also revealed a main effect of Target Similarity, $F(2,192) = 71.00$, $p < .01$, $\eta = .52$ (Other $ps > .16$). Participants judged the extremely similar target ($M = 5.45$, $SD = 1.47$) as closer to them than the moderately similar target ($M = 4.37$, $SD = 0.84$), $F(1,192) = 32.67$, $p < .01$, $\eta = .38$, and they judged both similar targets as closer to them than the dissimilar target ($M = 3.19$, $SD = 0.86$), $F(1,192) = 111.79$, $p < .01$, $\eta = .61$.

An ANOVA on the relevance question showed a main effect of target similarity, $F(2,192) = 13.37$, $p < .01$, $\eta = .26$, a main effect of Cognitive Busyness, $F(1,192) = 12.52$, $p < .01$, $\eta = .25$, and the predicted Target Similarity × Cognitive Busyness interaction, $F(2,192) = 8.22$, $p < .01$, $\eta = .20$ (Other $ps > .23$). Further analyses revealed that non-busy participants judged the extremely similar target as more relevant ($M = 4.36$, $SD = 0.70$) than busy participants ($M = 3.28$, $SD = 1.22$),

Table 2
Mean (*SD*) self-perceived competence scores (1–100) as a function of cognitive load, target performance, and target similarity

	Cognitive load			
	Present		Absent	
Target performance:	Good	Bad	Good	Bad
Target similarity:				
Extremely similar	83.94 (09.33)	50.69 (13.43)	81.13 (09.02)	52.77 (13.90)
Moderately similar	79.06 (12.87)	59.81 (10.65)	52.89 (14.38)	82.17 (13.34)
Dissimilar target	57.94 (14.72)	78.65 (10.44)	70.11 (12.87)	66.71 (21.86)

Note: Higher scores indicate greater self-perceived competence.

$F(1,192) = 15.08$, $p < .01$, $\eta = .27$. Likewise, non-busy participants judged the moderately similar target as more relevant ($M = 4.36$, $SD = 0.68$) than busy participants ($M = 3.59$, $SD = 0.89$), $F(1,192) = 8.34$, $p < .01$, $\eta = .20$. In contrast, cognitively busy participants' judgment of the dissimilar target's relevance ($M = 2.97$, $SD = 1.29$) did not differ from non-busy participants' ratings of this target's relevance ($M = 3.27$, $SD = 1.28$) ($F < 1.00$).

Main analyses

Participants' self-perceived competence scores were investigated by performing a Target Similarity × Cognitive Busyness × Target Performance ANOVA. This analysis revealed a main effect of Target Performance, $F(1,192) = 8.93$, $p < .01$, $\eta = .21$, a Target Performance × Cognitive Busyness interaction, $F(1,192) = 6.52$, $p < .$ $\eta = .18$, a Target Similarity × Target Performance interaction, $F(2,192) = 42.37$, $p < .01$, $\eta = .43$, and the predicted three-way interaction, $F(2, 192) = 31.14$, $p < .01$, $\eta = .37$, (Other effects, Fs < 1.00).

As can be seen in Table 2, these results expected (also see Study 1), that in the non-busy conditions, moderately similar others yielded contrast, whereas dissimilar others evoked comparison effect. Specifically, non-busy participants rated themselves more positively when they were exposed to a moderately similar other who had performed poorly ($M = 82.17$, $SD = 13.34$) than when exposed to a moderately similar other who had performed well ($M = 52.89$, $SD = 14.38$), $F(1,192) = 2$ $< .01$, $\eta = .35$. This effect did not occur when non-busy participants were exposed to dissimilar others. That is, ratings of those participants who were exposed to a high-performing dissimilar other ($M = 70.11$, $SD = 12.86$) did not reliably differ from those who were exposed to a low-performing dissimilar other ($M = 66.71$, $SD = 21.86$), $F < 1.00$.

In the cognitive busyness conditions, however, moderately similar others yielded assimilation and dissimilar others yielded contrast: Busy participants rated themselves more positively when they were exposed to a moderately similar other who had performed well ($M = 79.06$, $SD = 12.87$) than when exposed to a moderately similar other who had performed poorly ($M = 59.81$, $SD = 10.65$), $F(1,192) = 10.30$, $p < .01$, $\eta = .23$. This effect reversed when busy participants were exposed to dissimilar others. That is, busy participants rated themselves less positively when they were exposed to a distant other who had performed well ($M = 57.94$, $SD = 14.72$) than when exposed to a distant other who had performed poorly ($M = 78.65$, $SD = 10.44$), $F(1,192) = 11.79$, $p < .01$, $\eta = .24$. The effects of comparisons with moderately similar and dissimilar comparison targets thus replicated the pattern of results found in Study 1.

In the extremely similar conditions, we found the expected assimilation effects, independent of cognitive busyness (see Table 2). In the cognitive busyness conditions participants rated themselves more positively when they were exposed to a extremely similar other who had performed well ($M = 83.94$, $SD = 9.33$) than when exposed to an extremely similar other who had performed poorly ($M = 50.69$, $SD = 13.43$), $F(1,192) = 47.51$, $p < .01$, $\eta = .45$. This same pattern of effects occurred in the non-busy conditions, where high performing ($M = 81.13$, $SD = 9.02$) and low performing ($M = 52.77$, $SD = 13.90$) extremely similar others led to assimilative social comparison effects, $F(1,192) = 35.61$, $p < .01$, $\eta = .40$.

General discussion

The findings from these two studies clearly support our hypothesis that the amount of cognitive effort people put into the comparison process is an important determinant of the impact of target similarity on the outcome of this process. Specifically, our results show that when perceivers are able to devote adequate cognitive resources, to the social comparison process, extremely similar others yield assimilation, moderately similar others yield contrast, and dissimilar others yield no effect. When perceivers are cognitively busy, the impact of similarity is different. Then both extremely and moderately similar others yield assimilation, whereas dissimilar others yield contrast. These findings thus support the notion that target similarity is seen as a proxy for relevance when people are not busy, whereas this is less the case when people are busy. Indeed, in both studies we provide clear evidence that when participants have enough cognitive resources, relevance is associated with similarity,

such that, in general, similar others are perceived as more relevant than dissimilar others. Moreover, when people are cognitively taxed, target similarity feeds directly into self-evaluations, such that similarity cues assimilation and dissimilarity cues contrast.

The findings of the present studies also nicely bring together the findings of previous work on the impact of cognitive load or busyness on social comparison effects. In particular, the present studies reconcile the seemingly inconsistent perspectives presented by Pelham and Wachsmuth (1995) and Gilbert et al. (1995). Namely, our research demonstrates that when comparison targets are moderately or extremely similar to the self (such as when they share the same major or are college roommates), the structure of results supports the Pelham and Wachsmuth perspective: Contrast when perceivers are thinking hard, assimilation when perceivers are hardly thinking. Moreover, our research suggests that when comparison targets are somewhat dissimilar to the self (such as when they are from a different major or are a virtual stranger), the pattern of results best fits the model put forward by Gilbert et al. (1995): Contrast when perceivers are hardly thinking, null effects when they are thinking hard.

As we noted in the introduction, one of the fundamental truths of studies on social comparisons is that people do not compare with just anyone, but rather with similar others (e.g., Festinger, 1954; Goethals & Darley, 1977; Lockwood & Kunda, 1997; Tesser, 19). That is, a myriad of studies have shown that when people can devote adequate mental resources to the comparison process, similar comparison others typically affect self-judgments, but dissimilar others do not. These findings provide both verification and falsification of this truth. In the present research, similarity turned out to be a precondition for the occurrence of social comparison effects, only when people could think hard about social comparison information. When this was the case, dissimilar others had no effect, moderately similar others yielded contrast, and extremely similar others yielded assimilation, supporting previous social comparison studies. However, when people were cognitively busy, the effect of similarity was dramatically altered. In those conditions, both moderately and extremely similar others yielded assimilation and dissimilar others yielded contrast rather than null effects. Although this nuanced view of social comparison is perhaps not so welcome a message for those of us who like straightforward, unidirectional models of mental life, we think it is veridical to the way people's minds work.

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