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FlashReport

The causality implicit in traits

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HIGHLIGHTS

- Traits are ambiguously descriptions of behaviors or persons, or causes of behaviors.
- Past research suggests traits function as causes, when people judge causal relations.
- But would this occur if "causality" were not explicit in the instructions.
- Lexical decisions were faster for behaviors primed by traits in causal lists.
- Results suggest automatic activation of causal relations between traits and behaviors.
- Traits' meanings implicitly include causing behaviors.

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ABSTRACT

Are personality trait concepts merely descriptive of behaviors or do they describe causes? Social psychologists have differing views. Thus we looked at lexical decision response times (RTs) in a list context paradigm, which presents prime–target pairs embedded in lists of different contexts. In lists of associated pairs, traits did not affect RTs to related behaviors. But in lists of causally related pairs, traits primed RTs to behavioral words. Causality was never mentioned, and RTs were short enough to suggest automatic processing. This is consistent with other research on priming thematic relations. It also indicates that traits are implicit causes rather than mere descriptions of behavior, at least among Western participants. This challenges some current formulations in the social psychology of impression formation.

Introduction

Personality traits are among the oldest concepts in psychology and are interpreted in several ways. Costa & McCrae have long held that traits are internal causes of behavior, "endogenous dispositions that follow intrinsic paths of development essentially independent of environmental influences" (McCrae et al., 2000, p. 173). Jones and Davis (1965) also saw traits as causes of acts, and explored how they are inferred from behaviors in causal attributions (cf. Hamilton, 1998). On the other hand, Buss and Craik (1981) held that traits are merely descriptive of acts, and that trait categories have a graded structure and prototypic behavioral members. Mischel focused on traits as more descriptive of behaviors than persons, and showed that traits' meanings are often implicitly conditional on the situation (e.g. Wright & Mischel, 1987). Traits are inherently ambiguous and can be used in several ways (Uleman, 2005). Thus one may say that "he is [dispositionally, always] hostile," "he is hostile [now]," "that [act] was hostile," or "that [act] was hostile [in this situation, or in that sense]." The intended meaning is usually clear from the linguistic and pragmatic context. As Wittgenstein said, "the meaning of a word is its use in the language" (Brenner, 1999).

But traits' meanings are not completely ambiguous or they would not communicate anything. When isolated from a communicative context, do traits explain or merely describe behavior? This question arose in the study of spontaneous trait inferences (STIs; see Uleman, Rim, Saribay, & Kressel, 2012), i.e., trait concepts that are activated by behaviors but without perceivers' intentions and often without awareness. Do such concepts — which may never be put to any "use in the language" — explain why the actor engaged in the behavior or merely describe the actor and/or behavior? When reading that "the secretary solved the mystery half way through the book" unintentionally and unconsciously activates *clever*, is *clever* a cause or merely a description?

Carlston and Skowronski (2005) argued that STIs are causes because they result from (causal) attributional processes because they share several features with intentionally formed impressions. For example, they are more likely for negative than positive behaviors, and they are disrupted by doubts about the truth value of behavior descriptions

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(Crawford, Skowronski, Stiff, & Scherer, 2007). They differ from spontaneous trait transferences (STTs), which Carlston and Skowronski (2005) argue are based on purely associative processes and which show neither effect. (STTs occur when a communicator who describes an actor's behavior becomes associated with that behavior's trait implications. Both STIs and STTs are usually unconscious.) Thus in this view, a concept's meaning depends on the process that produces it. Hamilton (1998) used a similar meaning-from-process argument but arrived at the opposite conclusion. In his view, causes only arise from intentional causal attribution processes. Because STIs are unintentional, they cannot be causal attributions. Again, inference processes determine meanings.

Here we argue that personality traits are implicitly causal explanations of people's behaviors. Although conversational usage can change this, and trait terms can be used in several other ways, their meaning includes being the causes of people's behaviors.

There is already some evidence for this. Fenker, Waldmann, and Holyoak (2005) used a relation recognition paradigm and found that causal relations between word pairs (e.g., *sunshine–freckles*) are identified faster when the words are presented in a predictive sequence (*cause*, then *effect*) than in a diagnostic sequence (*effect*, then *cause*). They theorized that concepts are stored in this sequence in semantic memory because they occur in this order in experience. Kressel and Uleman (2010) noted that contrary to the experience of observing causes followed by effects, STIs provide examples of effects (behaviors) followed by causes (inferred traits). Furthermore, traits are never observed, only inferred. Would traits nevertheless function as causes in the Fenker et al. paradigm? Kressel and Uleman (2010) used trait–behavior (adjective–verb) pairs (e.g., *clumsy–stumble*) in the relation recognition paradigm, along with the non-social stimuli of Fenker et al. Surprisingly, they found the same response time asymmetry for both stimulus sets. Participants recognized non-social causal relations ("either because the concept described by the first word *causes* or is *caused by* the concept described by the second word") 77 ms faster for presentations in the predictive than in the diagnostic order. And they recognized causal relations between the social pairs 72 ms faster for presentations in the predictive (trait → behavior) than the diagnostic (behavior → trait) direction. "Apparently traits and behaviors are causally related in semantic memory, regardless of how these concepts are activated" (Kressel & Uleman, 2010, p. 216).

However, this relation recognition paradigm has drawbacks. The theoretical rationale does not apply to traits, which are never observed. Relationship judgments are relatively slow (means in the 1200 to 1300 ms range) compared with lexical decision or pronunciation tasks. And causality is explicit in the task instructions. In order to corroborate Kressel and Uleman (2010), we sought another paradigm that makes no mention of causality and might yield shorter RTs.

In many spreading activation models of semantic memory, the links or relations themselves between concepts have distinct conceptual meanings (Collins & Loftus, 1975; Moss, Ostrin, Tyler, & Marslen-Wilson, 1995; Quillian, 1967). Functional relations (e.g., instrument/action pairs such as *broom/sweep*) are especially central to meaning. Lucas (2000) compared the size of semantic priming effects as a function of the semantic relation between prime–target pairs, in a recent meta-analysis. Functional relations produced the largest priming effect size (0.55) whereas other semantic relations — synonyms, antonyms, category coordinates, and script relations — produced effect sizes from 0.20 to 0.27. Only studies that equated simple associative strength across all types of semantic primes were included, to ensure that discrepancies in effect sizes were not due to differential cue–target word association frequencies. Importantly, causal relations are one kind of functional relation.

The importance and distinctiveness of functional relations are also seen in patients with Wernicke's aphasia. Also known as semantic dementia, this condition impairs language comprehension but other aspects of language, such as syntax and phonology, remain intact. These patients cannot generate category exemplars, name pictures, or match pictures to spoken words, and seem unable to understand familiar words. Despite these deficits, they show implicit knowledge of *functional* semantic relations — and functional relations only — as seen in large semantic priming effects for functionally related prime–target pairs in lexical decision tasks. This indicates that "the functional properties of concepts remain accessible well after other aspects of meaning are no longer available" (Tyler & Moss, 1997, p. 533).

McKoon and Ratcliff (1995) showed that one can prime the semantic relationship itself between pairs of concepts, through the relational context in which the pairs are embedded. For example, presenting prime–target pairs that are opposites (e.g., *tall–short*) in a lexical decision (or a pronunciation) task in which the other pairs in the list are also opposites produces faster response times (RTs) than when the other pairs are merely associates (e.g., *table–chair*) or synonyms. In this task, the nature of the relationship is never made explicit. Therefore this list context effect may provide another test of the purported causal relation between traits and behaviors without any explicit mention of causes or causality, and with relatively short RTs. Our prediction was that lexical decision RTs for trait–behavior pairs would be shorter in the context of a list of causally related concepts than in the context of associatively related pairs, because the causal list context would prime the implicit causal relation between traits and behaviors.

Method

Forty-five NYU undergraduates received course credit for their participation. This sample size was estimated from prior studies with this paradigm.

Stimuli consisted of prime–target word pairs: 108 cause–effect pairs, 108 associated pairs, 32 trait–action pairs, 32 unprimed actions (preceded by unrelated words), and 112 word–nonword pairs. All pairs except the last were from the USF free association norms (Nelson, McEvoy, & Schreiber, 1998), and were chosen for their *low association values*. For the causal list, the forward strength of association (proportion of respondents giving a particular response, or FSG in Nelson et al., 1998) averaged 0.036 and had a median of 0.01 (i.e., 3.6% and 1% of participants gave that response). The associated list, selected to match as closely as possible, had a mean of 0.040 and a median of 0.01. The trait–action list had a mean of 0.067 and a median of 0.033. Cause–effect pairs (*acid–corrosion* to *wind–erosion*), associated pairs (*acrobat–athletes* to *vessel–vein*), and trait–action pairs (*afraid–run* to *violent–hit*) were selected by the first author. Causal pairs from Fenker et al. (2005) were included whenever normed. All sets are available from the authors.

These stimuli made up two causal and two associated lists, each with 98 trials. They contained 54 cause–effect (or associated) pairs, 4 trait–action pairs, 4 unprimed action pairs, and word–nonword pairs. Trait–action and unprimed action pairs always appeared in the same position in the lists, whereas other pairs were pseudo-randomly dispersed throughout the lists. Across participants, trait–action pairs appeared equally often in causal and associated list contexts, and never twice for any participant.

Participants made speeded lexical decisions for targets in the two associated lists and then the two causal lists. On each trial, a fixation cross (250 ms) was followed by the prime word (250 ms) and then the target word, on screen until participants responded "word" (press the c-key) or "nonword" (the n-key). They were asked to read (and memorize for a subsequent memory test) the first word in each pair, and then judge as quickly as possible whether or not the following letter string was a word. Relationships between primes and targets were never characterized.

Results

Correct RTs to actions primed by traits in the causal list context ($M = 520$, $SD = 96$) were 48.9 ms faster than in the associated list

context ($M = 569$, $SD = 122$), $t(44) = 3.27$, $p < .01$, $d = 0.44$, confirming our hypothesis. Incorrect responses (2%) were excluded from the analyses, as were the 1.6% outlier trials (two *SD*s from each participant's mean RT for each trial type).

Actions were primed by either traits or unrelated words. A 2 (list context: causal vs. associated) × 2 (primed by trait: yes vs. no) within-Ss ANOVA yielded a significant interaction, $F(1,44) = 6.0$, $p < .05$, showing that priming effects only occurred for trait–action pairs in the causal list context. In the causal list context, RTs were 78.04 ms faster to actions primed by traits ($M = 520$, $SD = 96$) than to unprimed actions ($M = 598$, $SD = 166$), $t(44) = 4.36$, $p < .01$, $d = 0.57$. In the associated list context, there was no difference in RTs between actions primed by traits ($M = 569$ ms, $SD = 122$) and actions primed by unrelated words ($M = 583$, $SD = 140$), $t(44) = .82$, $p = .41$. See Fig. 1.

Discussion

In the causal but not the associated list context, traits primed lexical decisions about action words. These results are consistent with McKoon and Ratcliff's (1995) findings "that relational context affected lexical decision and naming responses — tasks that have been argued to reflect automatic processing" (p. 532). Our RTs are comparable, equally automatic, and extend their results to the causal relations between traits and actions. Importantly, this conceptually replicates Kressel and Uleman's (2010) findings but with a paradigm that makes no mention of causality. It supports our hypothesis that one aspect of traits' meaning is that they are causally related to behaviors, and do not merely describe them.

It may seem odd that traits do not prime behaviors in the associated list context. But remember, all pairs including the trait–behavior pairs were chosen for their very low association values. Although word associations are only one aspect of meaning (see below), and reflect many different things, they are what drives priming in the associated list context.

The thematic conception of meaning that emerges here goes beyond both associative and attributional accounts. Estes, Golonka, and Jones (2011) summarized behavioral and neuroscience evidence on word associations, noting that "thematic relations are distinct from mere associations, scripts, ad hoc categories, and taxonomic categories…. Thematic thinking typically occurs uncontrollably and quickly, and is guided primarily by the frequency and recency of experience with specific thematic relations" (p. 287). There are many kinds of thematic relations besides causal. Concepts may be thematically related in terms of space, time, function, possession, production, habitation, etc.; the list is innumerable. What makes relations "thematic" is their "externality" (they "occur between two or more things") and their "complementarity" (the things "fulfill different roles in the given theme," Estes et al., p. 252). Mere associations, on the other hand, are simply what comes to mind most readily in free associations. Mere associations have

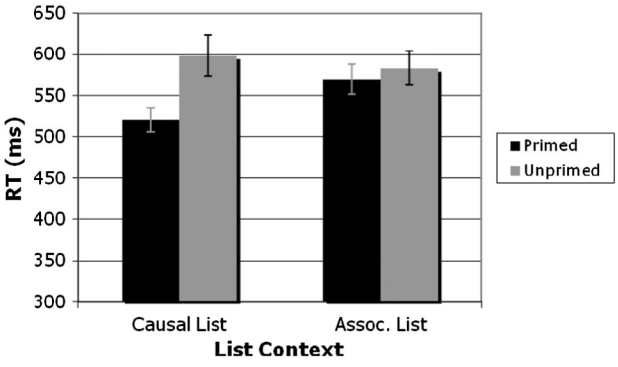

Fig. 1. Magnitude of trait–action priming effects in causal and associated list contexts.

behavioral and neurological correlates that distinguish them from concepts related taxonomically or thematically (e.g., Estes et al., 2011; Moss et al., 1995).

Among the more top-down analyses prominent in social psychology, several propose that the effects of primes and the directions of inference depend on context, not just on mere associations. Wheeler, Demarree, and Petty's (2007) Active-Self account outlines "how involvement of the active self-concept can increase, decrease, or reverse the effects of primes" (p. 234). Loersch and Payne's (2011) situated inference model holds that "when it is mistakenly viewed as originating from one's own internal thought processes… the prime-related mental content becomes a possible source of information for solving whatever problems are afforded by the current situation…[so that] the inferred meaning of this prime-related content can vary greatly" (p. 234). And Fujita and Trope (2014) propose that distinct procedural mindsets affect priming effects. Under "structured regulation, people process information in light of their valued goals, responding to salient situational cues only to the extent that those cues are goal-relevant…. in unstructured regulation, people … [evince] a greater openness to responding to salient cues in a cue consistent manner" (p. 68).

Associative accounts of semantic memory omit the thematic aspects of concepts' meaning. Classic attributional accounts omit the ways that unconscious inferences depend on meanings and contexts in multiple ways. Our results confirm that part of traits' meaning is that they are causally related to behaviors. They are rich and complex packets of meaning. Specifying how their meanings are unpacked and manifest in particular contexts will require both bottom-up and top-down theory. Their causal meaning need not depend on activating traits through causal attributional processes, whether conscious (Hamilton, 1998) or unconscious (Carlston & Skowronski, 2005), although such processes surely activate the causal relations that are already there (Uleman, 2015).

Although our results are limited to "causal contexts," most textual and social contexts may be causal (e.g., Banerjee & Bloom, 2014; Fletcher, Hummel, & Marsolek, 1990). This is an empirical issue for future research.

References

Banerjee, K., & Bloom, P. (2014). Why did this happen to me? Religious believers' and non-believers' teleological reasoning about life events. *Cognition*, *133*, 277–303. http://dx.doi.org/10.1016/j. cognition .2014.06.017.

Brenner, W.H. (1999). *Wittgenstein's philosophical investigations.* Albany, NY: State University of New York Press.

Buss, D.M., & Craik, K.H. (1981). The act frequency analysis of interpersonal dispositions: Aloofness, gregariousness, dominance and submissiveness. *Journal of Personality*, *49*, 175–211.

Carlston, D.E., & Skowronski, J.J. (2005). Linking versus thinking: Evidence for different associative and attributional bases of spontaneous trait transference and spontaneous trait inference. *Journal of Personality and Social Psychology*, *89*, 884–898. http://dx.doi.org/10.1037/0022-3514.89.6.884.

Collins, A. M., & Loftus, E.F. (1975). A spreading-activation theory of semantic processing. *Psychological Review*, *82*, 407–428. http://dx.doi.org/10.1037//0033-295X.82.6.407.

Crawford, M.T., Skowronski, J.J., Stiff, C., & Scherer, C.R. (2007). Interfering with inferential but not associative processes underlying spontaneous trait inference. *Personality and Social Psychology Bulletin*, *33*, 677–690. http://dx.doi.org/10.1177/0146167206298567.

Estes, Z., Golonka, S., & Jones, L.L. (2011). Thematic thinking: The apprehension and consequences of thematic relations. In B. Ross (Ed.), *The psychology of learning and motivation. Vol. 54.* (pp. 249–294). Burlington: Academic Press. http://dx.doi.org/10.1016/B978-0-12-385527-5.00008-5.

Fenker, D.B., Waldmann, M.R., & Holyoak, K.J. (2005). Accessing causal relations in semantic memory. *Memory and Cognition*, *33*, 1036–1046. http://dx.doi.org/10.3758/BF03193211.

Fletcher, C.R., Hummel, J.E., & Marsolek, C.J. (1990). Causality and the allocation of attention during comprehension. *Journal of Psychology*, *16*, 233–240. http://dx.doi.org/10.1037/0278-7393.16.2.233.

Fujita, K., & Trope, Y. (2014). Structured versus unstructured regulation: On procedural mindsets and the mechanisms of priming effects. Supplement on understanding priming effects in social psychology. *Social Cognition*, *32*(Suppl.68), 68–87. http://dx.doi.org/10.1521/soco.2014.32.

Hamilton, D.L. (1998). Dispositional and attributional inferences in person perception. In J.M. Darley, & J. Cooper (Eds.), *Attribution and social interaction: The legacy of Edward E.*

Jones (pp. 99–114). Washington, D.C.: American Psychological Association. http://dx.doi.org/10.1037/10286-000.

Jones, E.E., & Davis, K.E. (1965). From acts to dispositions: The attribution process in person perception. In L. Berkowitz (Ed.), *Advances in experimental social psychology. Vol. 2*. (pp. 219–266). New York: Academic Press. http://dx.doi.org/10.1016/S0065-2601(08)60107-0.

Kressel, L.M., & Uleman, J.S. (2010). Personality traits function as causal concepts. *Journal of Experimental Social Psychology*, *46*, 213–216. http://dx.doi.org/10.1016/j.jesp.2009.08.018.

Loersch, C., & Payne, B.K. (2011). The situated inference model: An integrative account of the effects of primes on perception, behavior, and motivation. *Perspectives on Psychological Science*, *6*, 234–252. http://dx.doi.org/10.1177/1745691611406921.

Lucas, M. (2000). Semantic priming without association: A meta-analytic review. *Psychonomic Bulletin & Review*, *7*, 618–630. http://dx.doi.org/10.3758/BF03212999.

McCrae, R.R., Costa, P.T. Jr, Ostendorf, F., Angleitner, A., Hřebíčková, M., Avia, M.D., et al. (2000). Nature over nurture: Temperament, personality and life span development. *Journal of Personality and Social Psychology*, *78*, 173–186. http://dx.doi.org/10.1037//0022-3514.78.1.173.

McKoon, G., & Ratcliff, R. (1995). Conceptual combinations and relational context in free association and priming in lexical decision and naming. *Psychonomic Bulletin & Review*, *2*, 527–533. http://dx.doi.org/10.3758/BF03210988.

Moss, H.E., Ostrin, R.K., Tyler, L.K., & Marslen-Wilson, W.D. (1995). Accessing different types of lexical semantic information: Evidence from priming. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *21*, 863–883. http://dx.doi.org/10.1037//0278-7393.21.4.863.

Nelson, D.L., McEvoy, C.L., & Schreiber, T.A. (1998). The University of Southern Florida word association, rhyme, and word fragment norms. http://web.usf.edu/FreeAssociation/

Quillian, M.R. (1967). Word concepts: A theory and simulation of some basic semantic capabilities. *Behavioral Science*, *12*, 410–430. http://dx.doi.org/10.1002/bs.3830120511.

Tyler, L. K., & Moss, H.E. (1997). Functional properties of concepts: Studies of normal and brain damaged patients. *Cognitive Neuropsychology*, *14*, 511–545. http://dx.doi.org/10.1080/026432997381466.

Uleman, J.S. (2005). On the inherent ambiguity of traits and other mental concepts. In B.F. Malle, & S.D. Hodges (Eds.), *Other minds: How humans bridge the divide between self and others* (pp. 253–267). New York: Guilford Publications.

Uleman, J.S. (2015). Causes and causal attributions: Questions raised by Dave Hamilton and spontaneous trait inferences. In S.J. Stroessner, & J.W. Sherman (Eds.), *Social perception from individuals to groups* (pp. 52–70). New York: Psychology Press.

Uleman, J.S., Rim, S., Saribay, S.A., & Kressel, L.M. (2012). Controversies, questions, and prospects for spontaneous social inferences. *Social and Personality Psychology Compass*, *6*, 657–673. http://dx.doi.org/10.1111/j.1751-9004.2012.00452.x.

Wheeler, S.C., Demarree, K.G., & Petty, R.E. (2007). Understanding the role of the self in prime-to-behavior effects: The Active-Self account. *Personality and Social Psychology Review*, *11*, 234–261. http://dx.doi.org/10.1177/1088868307302223.

Wright, J.C., & Mischel, W. (1987). A conditional analysis of dispositional constructs: The local predictability of social behavior. *Journal of Personality and Social Psychology*, *53*, 1159–1177.