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Four meanings of "categorization": A conceptual analysis of research on person perception

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Abstract

It is widely assumed that people tend to "categorize" other people. However, the term "categorization" has been used with qualitatively different underlying definitions in the person perception literature. We present a conceptual analysis in which we disentangle four existing definitions: (a) categorization as representing, (b) categorization as dichotomizing, (c) categorization as organizing, and (d) categorization as grouping. Subsequently, we show that seemingly antagonistic viewpoints in the literature may be reconciled by disentangling these definitions. Furthermore, we argue that disentangling these definitions is vital for theoretical interpretations of (past and future) empirical findings. Overall, our work aims to contribute to the clarity of person perception theories, provide novel perspectives on existing debates, and serve as a stepping stone for more differentiated models of person perception.

KEYWORDS

categorization, conceptual analysis, social perception, stereotyping

1 | INTRODUCTION

People spontaneously categorize other people and use the knowledge that is associated with those categories to guide their behavior. For example, upon encountering another person, we may immediately categorize the person as a "policeman," infer that the person may have a relatively dominant personality, and adjust our behavior to be respectful to the other person. This is how the person perception process has been characterized by social categorization models. These models have been highly influential in the person perception literature (Brewer, 1988; Fiske & Neuberg, 1990; Freeman & Ambady, 2011; Hugenberg, Young, Bernstein, & Sacco, 2010) and have been used to explain various phenomena related to stereotyping, prejudice, and biases in judgments and memory (Allport, 1954; Hugenberg, Miller, & Claypool, 2007; Hugenberg et al., 2010; Klauer & Wegener, 1998; Tajfel & Wilkes, 1963; Tajfel, 1969; Taylor, Fiske, Etcoff, & Ruderman, 1978; Young & Hugenberg, 2011).

Notwithstanding their pivotal role in the literature, social categorization models have been criticized due to conceptual issues. For example, Quinn and Macrae (2005) noted that researchers have reached seemingly antagonistic conclusions from the empirical literature and speculated that this may be because there is no consensus on the question how the term "categorization" should be defined in the person perception literature. Furthermore, Kunda

and Thagard (1996) noted that researchers have distinguished between categorical and non-categorical processes in person perception while leaving ambiguous what exactly distinguishes these two types of processes. Similar concerns were raised by Cox and Devine (2015). Because of such issues, some have argued for models that avoid the typical notions of social categorization models (Cox & Devine, 2015; Kunda & Thagard, 1996).

What is the cause of these issues? As Quinn and Macrae (2005) suggested, a likely cause is that different researchers have used the term "categorization" with different definitions. If that is the case, a possible solution may be to disentangle the confounded definitions and investigate whether the issues could reflect different usages of the term "categorization." For example, seemingly antagonistic viewpoints may turn out to be compatible if they employ the term "categorization" with different definitions. However, as yet, it has remained relatively unclear what those confounded definitions are, and whether disentangling them can address existing issues.

In the present article, we present a conceptual analysis in which we disentangle four definitions with which the term "categorization" has been used in the person perception literature. Next, we demonstrate how confounding these definitions may have contributed to several open questions in the literature. Conversely, we argue that disentangling the definitions may help to answer those questions. In the following, we briefly describe several existing issues in the person perception literature for which this conceptual contribution is relevant.

2 | OPEN QUESTIONS

First, there are seemingly antagonistic viewpoints about the question how integral categorization is to person perception. According to the traditional view, "categorization" is an inevitable part of person perception—there cannot be person perception without it (Allport, 1954). In contrast, other researchers argued that "categorization" may be only one of several processing strategies that social perceivers can employ, and that social perceivers rely on categorization only under certain conditions (Macrae, Bodenhausen, Milne, Thorn, & Castelli, 1997; Macrae & Bodenhausen, 2000). We aim to show that these viewpoints may not be as antagonistic as they seem. That is, both the hypothesis that "categorization" is inevitable and that "categorization" is a conditional strategy can be true at the same time, if those hypotheses employ different definitions of the term "categorization."

Second, if one adopts the viewpoint that "categorization" is a conditional processing strategy, it is relatively unclear to what extent social perceivers rely on "categorization." While the more traditional view is that "categorization" is a frequently employed default of person perception (Brewer, 1988; Fiske & Neuberg, 1990), some researchers noted that non-categorical processes may be relatively common (Blair, Judd, Sadler, & Jenkins, 2002; Blair, Judd, & Chapleau, 2004; Blair, Judd, & Fallman, 2004; Krueger & Rothbart, 1988). As a result, there is no clear answer to the question of how frequently people "categorize." We suggest that this issue may not reflect solely insufficient empirical data but also different employed definitions of "categorization" in the literature. That is, the same set of findings may support the conclusion that people "categorize" frequently under some definitions but not under others. Disentangling these definitions is therefore an important requirement to reach a coherent conclusion about the frequency with which people "categorize."

Third, there has been debate about the scientific value of the key notions of social categorization models. In particular, there appear to be ambiguities in the way researchers distinguished "categorization" from other hypothetical processes (Cox & Devine, 2015; Kunda & Thagard, 1996; Quinn & Macrae, 2005). For example, although "categorization" has been defined as grouping individuals (e.g., Mason & Macrae, 2004), mapping a person onto a personality trait (e.g., this person is "intelligent") has been explicitly distinguished from "categorization" (Fiske, Neuberg, Beattie, & Milberg, 1987; Fiske & Neuberg, 1990). However, Kunda and Thagard (1996) noted that people can be grouped based on virtually every property—including personality traits (e.g., the group of intelligent people). For such reasons, conceptual distinctions between "categorization" and alternative processes have been rejected by some researchers (Cox & Devine, 2015; Kunda & Thagard, 1996).

We suggest that a source of the issues above may be that terms like "category" and "categorization" have been used with different underlying definitions, and that these definitions are currently confounded in the literature. If this is the case, then the issues above may be addressed (at least, in part) by disentangling the confounded definitions of "categorization."

3 | CONCEPTUAL ANALYSIS

Our conceptual analysis identifies and disentangles four different definitions with which the term "categorization" has been used in the person perception literature. First, the term "categorization" has been used to refer to the process of mapping external stimuli onto internal representations (the *representing* definition). Second, the term "categorization" has been used to refer to the process of mapping stimuli that vary on graded dimensions onto binary all-or-none representations (the *dichotomization* definition). Third, the term "categorization" has been used to refer to the process of summarizing information about other people in terms of organizing representations (the *organizing* definition). Fourth, the term has been used to refer to the process of construing perceived people as interchangeable members of social groups rather than separate individuals (the *grouping* definition). An overview of these definitions and related terminology is given in Table 1. Readers who wish to see more "evidence" that these definitions have been used in the literature are referred to the Appendix in which we provide a selection of relevant quotations.

Definition 1: Categorization as *representing*

The term "categorization" has often been used to refer to the process of mapping external stimuli onto internal representations (Macmillan, Kaplan, & Creelman, 1977; Medin & Smith, 1984; Smith & Medin, 1981; see also: Mervis & Rosch, 1981) According to this definition, any kind of conception of a stimulus as "something" constitutes categorization. This includes perceiving a person as a member of a social group (e.g., this person is a "professor"), recognizing a person's identity (e.g., this person is "Mary"), or judging a person's character (this person is "friendly"). Hence, under the *representing* definition, "categorization" is a very general cognitive function.[1]

There has been very little debate about the question of whether people "categorize" under the *representing* definition. In fact, it is widely assumed in cognitive science that perception (including person perception) involves some form of mapping stimuli onto internal representations.[2] Virtually every existing person perception model in the literature assumes that social perceivers mentally represent other people in some way (e.g., Brewer, 1988; Ehret, Monroe, & Read, 2014; Fiske & Neuberg, 1990; Freeman & Ambady, 2011; Greenwald & Banaji, 1995; Hugenberg et al., 2010; Kunda & Thagard, 1996; Smith & DeCoster, 1998; Zebrowitz, Fellous, Mignault, & Adreoletti, 2003), and under the *representing* definition of "categorization," this entails that virtually every person perception model assumes that perceivers "categorize." Nevertheless, there has been debate in the past on the question of how exactly the mapping of stimuli onto representations is performed. Awareness of two models of this mapping is particularly important in order to disentangle the *representing* definition from other definitions: the classical and prototype models. These models are well known, and we therefore summarize them only briefly before we proceed with our conceptual analysis.

According to the classical model, a perceived stimulus is mapped onto an internal representation if and only if the stimulus contains a number of necessary and jointly sufficient features (e.g., a stimulus may be categorized as a pen if and only if it is long and thin and can write; Medin & Smith, 1984; Smith & Medin, 1981). Importantly, this model implies that only two discrete cognitive outcomes are possible: Either a representation is not mapped onto the stimulus (because it does not have all necessary features) or it is mapped onto the stimulus (because it has a jointly sufficient set of features). In contrast, according to the prototype model, "categorization" is seen as a graded similarity judgment between an external stimulus and an internal representation (Medin & Smith, 1984; Mervis & Rosch, 1981; Smith & Medin, 1981; Smith & Zarate, 1990). Thus, a key difference is that the classical model assumes that our brain makes a *binary* decision during "categorization" (a stimulus is seen as 'X' or 'not-X') while prototype models assume that the mapping of stimuli onto internal representation is *graded* (the stimulus could be categorized as a better or

TABLE 1 An overview of the four discussed definitions of "categorization"

Definition	Categorical representation	Non-categorical representation	Categorical processing	Non-categorical processing
1. Categorization as *representing*	Any mental representation	Not explicitly defined	Perceiving a person as "something"	Not explicitly defined
2. Categorization as *dichotomizing*	An all-or-none representation	A graded representation	Perceiving a person as either *X* or not *X*	Perceiving a degree to which a person is *X*
3. Categorization as *organizing*	The representation that has the most associations with other observed properties of a person	All other observed properties of a person	Reducing a person to the property (e.g., man) that has the most associations with other observed properties (e.g., tall, beard, and dominant)	Looking at all individual properties of a person (e.g., man, tall, beard, and dominant)
4. Categorization as *grouping*	A representation of a group (e.g., man)	A representation of an individual (e.g., Brad Pitt)	Distinguishing between groups without necessarily distinguishing between their members	Distinguishing between individuals (even within groups)

Note. Most definitions distinguish between categorical representations ("categories") and non-categorical representations ("dimensions"/"features"/"attributes"/"exemplars"). Similarly, most definitions make a distinction between categorical and non-categorical processing (sometimes called "individuation").

worse example of 'X'). Keeping these two models in mind is important for distinguishing the *representing* definition from the next definition.

Definition 2: Categorization as *dichotomizing*

The term "categorization" has also been used to refer to the strategy to dichotomize information as opposed to employing graded information. In particular, Tajfel (1969) proposed that people can represent perceived people in terms of "attributes which vary on continuous dimensions" and "classifications [i.e. categories] which are discontinuous." He gave the example that "nationalities or racial groups are, on the whole, discontinuous [whereas] personal traits or characteristics can be empirically treated as dimensions much in the same way as height and weight would be" (Tajfel, 1969, p. 178). In more recent research, this has evolved into a conception in which categorical representations are *binary* representations (e.g., a person is either an "African American" or not) while non-categorical representations are *graded* representations (e.g., a person can be "trustworthy" to different degrees; Blair et al., 2002, 2004, 2005).

There are two noteworthy differences between the *representing* definition and the *dichotomization* definition of "categorization." First, under the *representing* definition, any mapping (non-graded or graded) of a stimulus onto a mental representation constitutes "categorization." In contrast, under the *dichotomization* definition, only some mental representations are conceptualized as "categories" (e.g., nationalities) and only mapping stimuli onto these particular type of representations is conceptualized as "categorization." Conversely, mapping stimuli onto other mental representations (e.g., personality traits) is not seen as categorization under the *dichotomization* definition. This means that "categorization" can be avoided in principle under the *dichotomization* definition by representing another person in terms of non-categorical representations (e.g., extravert) rather than categorical representations (e.g., Italian).

Second, under the *dichotomization* definition, the defining property that distinguishes categorical from non-categorical representations is that categorical representations are binary. This idea is reminiscent of the classical model of "categorization" (under the *representing* definition) in which "categorization" involves a binary decision of whether or not to map a stimulus onto an internal representation. However, there is an important conceptual difference: Under the *representing* definition, "categorization" is the general process of mapping stimuli onto internal representations independent of whether that mapping is binary (as in the classical model) or graded (as in prototype models). Consequently, under the *representing* definition, a binary mapping is merely one possible model of how perceivers may "categorize." In contrast, under the *dichotomization* definition categorization is a binary

mapping *by definition*. Consequently, graded mappings do not constitute "categorization" under the *dichotomization* definition.

This conceptual difference has consequences for the interpretation of empirical research. For example, consider the finding that the effect of African American race and Afrocentric facial features on judgments were differentially affected by a cognitive load manipulation. This finding was explained based on the idea that "the *continuous* nature of the features would make their strategic use much more difficult" (Blair, Judd, & Fallman, 2004, p. 768; emphasis added), suggesting that the processing of race is more effective under cognitive load. This reasoning seems to be based on the idea that African American race is not continuous in the mind of the perceivers (i.e., a target either belongs to the race or does not). As such, this reasoning appears to be based on the *dichotomization* definition and would not be consistent with the *representation* definition under which all representations can be continuous.

In fact, there is an even more general difference between the *dichotomization* and *representation* definitions. If one takes the *dichotomization* definition literally, then there is a substantial amount of findings that sheds doubt on categorization models. Specifically, it is a robust finding that people perceive a relatively graded fit between external stimuli and internal representations (Mervis & Rosch, 1981). This sheds doubt on the idea that people tend to dichotomize in their perception of other people: that is, that they "categorize" *under the dichotomization definition*. Likewise, there is evidence that race-based stereotyping gets gradually stronger as a function of the amount racial features of a perceived person (Blair et al., 2002, 2005; Blair et al., 2004). This challenges categorization models under the *dichotomization* definition because under this definition "categorization models of stereotyping tend to assume that category members will be stereotyped *to the same degree*" (Blair, Judd, & Fallman, 2004, p. 763, emphasis added). In contrast, none of these findings would challenge the notion that people tend to "categorize" under the *representing* definition because the *representing* definition allows for continuous representations (and stereotyping).

To be clear, researchers have not explicitly declared the substantial body of evidence for continuous perception and stereotyping as evidence against "categorization." Instead, the effect of the dichotomization definition on empirical conclusions tended to be somewhat milder such as the example of the assumed higher efficiency of the perception of race compared to the perception of racial features. Nevertheless, our reasoning above helps to make the principled differences between the *dichotomization* and *representing* definitions more visible and simultaneously reveals their potential impact on empirical conclusions: If one takes the *dichotomization* definition literally, then there is a substantial body of findings that sheds doubt on categorization models. In contrast, if one adopts the *representing* definition, then the same findings are compatible with the idea that people tend to categorize, because the *representing* definition allows for graded mappings. As such, the definition one adopts can have a major impact on a researcher's conclusion about the question whether people tend to "categorize." This illustrates (a) that the *representing* and *dichotomization* definitions are conceptually distinct and (b) that these definitions can lead to spuriously antagonistic conclusions from the same set of empirical findings if they are not disentangled.

Definition 3: Categorization as *organizing*

Other researchers used the term "categorization" to refer to the strategy to represent other people in terms of organizing representations rather than individual features. For example, rather than mapping a perceived person onto the features "tall," "beard," and "dominant," a social perceiver may map the person onto the representation "man," which organizes the other features. In particular, this definition of "categorization" has been adopted by Fiske et al. (1987) as well as by Fiske and Neuberg (1990) in their influential and widely cited continuum model. They distinguished between two types of internal representations: "categories" and "attributes" (Fiske et al., 1987; Fiske & Neuberg, 1990). Importantly, "the feature [/attribute] that a perceiver uses to *organize* and understand the remaining features *defines* the category […]" (Fiske & Neuberg, 1990, p. 9, emphasis added). Thus, a "category" (e.g., man) is the observed feature of a person, which best organizes the other features of the person (e.g., tall, beard, and dominant) while the remaining features are referred to as "attributes."

Based on this assumption, they proposed that a perceiver can process another person in (at least) two distinct ways (Fiske & Neuberg, 1990).[3] First, the perceiver may engage in categorical processing of another person (traditionally referred to as "category-based" processing). This involves processing the other person in terms of the best

organizing representation (e.g., the representation "man" and its associated stereotypes). Alternatively, the perceiver may engage in non-categorical processing of the other person (traditionally referred to as "attribute-based" or "individuating" processing). This involves processing the other person in terms of all observed properties (e.g., man, tall, beard, and dominant).

Importantly, the premise of this theorizing is that a person can be represented in terms of either the best organizing representation ("category") or individual properties ("attributes"). However, when is a property a good organizer of the other properties of a person? Fiske and Neuberg (1990) elaborated that "the category label has *more and stronger links* to the attributes than any single attribute has to the other attributes; hence the category label can be said to *organize* the attributes" (Fiske & Neuberg, 1990, p. 9, emphasis added). For example, if the set of observed properties is *man*, *tall*, *beard*, and *dominant*, the property *man* is the "category" if it has the most associations with other properties in this set (for direct quotations, see Appendix). Hence, under the *organizing* definition, categorical representations ("categories") differ from non-categorical representations ("attributes") in terms of their structural position in an associative network.

The *organization* definition differs conceptually from the *representing* definition. Under the *representing* definition, every mental representation constitutes a "category." In contrast, under the *organization* definition, only a subset of all mental representations constitute "categories" (i.e., those that organize observed properties), and only a mapping of a stimulus onto those mental representations constitutes "categorization." Consequently, while "categorization" is a seemingly inevitable part of person perception under the *representing* definition, "categorization" can in principle be avoided under the *organization* definition by processing the individual properties (e.g., man, tall, beard, and dominant) of the other person rather than reducing the other person to one organizing property (e.g., man).

The *organization* definition also differs conceptually from the *dichotomization* definition. Although both the *dichotomization* and *organization* definitions make a distinction between categorical and non-categorical representations, the *dichotomization* definition makes this distinction based on whether graded information is employed ("categories" are defined as all-or-none representations and non-categorical representations as graded) while the *organization* definition makes this distinction based on structural positions in an associative network ("categories" are defined by having the most and strongest associative links with other properties of the person). Consequently, evidence of graded processing (e.g., Blair et al., 2004) constitutes evidence of non-categorical processing under the *dichotomization* definition but not under the *organization* definition.

That the *organization* definition is distinct from other definitions is also evident in other existing interpretations of empirical findings. For example, what finding would lead to the conclusion that a personality trait is a "category" under the *organizing* definition? It has been reasoned as follows. Representations with an organizing positions have—by definition—relatively many associations, which may make them relatively effective sources of inferences about another person. Hence, if a representation does not seem to be an effective source of inferences about another person, it probably has few associative links. Importantly, a representation with few associative links is unlikely to act as an organizer of observed person properties. Thus, it was argued that "the category labels are most likely to be those features that generate relatively rich but distinct inferences" (Fiske et al., 1987, pp. 401–402).

There are a number of findings, which suggest that personality traits are relatively ineffective sources of inferences (Andersen & Klatzky, 1987; Andersen, Klatzky, & Murray, 1990; Bond & Brocket, 1987; Bond & Sedikides, 1988). For example, Andersen and Klatzky (1987) provided participants with a person label (e.g., politician or extravert) and instructed to list as many properties a person with that label is likely to have. They found that participants listed relatively few novel properties based on personality traits (e.g., extravert) compared to other person labels (e.g., politician). This and other findings (Andersen et al., 1990; Bond & Brocket, 1987; Bond & Sedikides, 1988) have led to the conclusion that personality traits are unlikely to act as organizers of observed person properties (Fiske & Neuberg, 1990). This means that they are unlikely to act as "categories" under the *organization* definition. Notice that this reasoning uniquely applies under the *organization* definition where a category is defined in terms of its structural position in an associative network. Hence, the theoretical conclusions from empirical findings depend again

on the employed definition of "categories" and "categorization." This further illustrates that the *organization* definition is conceptually distinct from other definitions.

Definition 4: Categorization as *grouping*

Another definition is that categorization means to "characterize others on the basis of the social groups to which they belong [rather than to] view other people […] as unique entities" (Mason & Macrae, 2004, p. 1785; see also Hugenberg et al., 2010; Macrae & Bodenhausen, 2000; Macrae & Bodenhausen, 2001). Put differently, "categorization" entails to map several people onto the same internal representation (e.g., when looking at three people, we may see: "man," "man," and "man"), while non-categorical processing entails mapping each individual onto a separate representation (e.g., when looking at three people, we may see: "Peter," "Dave," and "John"). This distinction is relatively common in the recent person perception literature (Hugenberg et al., 2010; Macrae & Bodenhausen, 2000; Macrae & Bodenhausen, 2001; Mason & Macrae, 2004), and also has connections to the extensive literature on self-categorization and social identity (Brown, 2000; Hornsey, 2008; Tajfel & Turner, 1986).

The *grouping* definition is conceptually different from Definitions 1–3. Under the *representing* definition (Definition 1), any mapping of a person onto an internal representation constitutes "categorization." In contrast, under the *grouping* definition, only a mapping onto some (group) representations constitutes "categorization" (e.g., "man" but not "Peter"). The *grouping* definition is also different from the *dichotomization* definition (Definition 2). Under the *dichotomization* definition (Definition 2), binary mappings constitute "categorization" but graded mappings do not. In contrast, under the *grouping* definition, mapping several people onto the same representation (e.g., man) constitutes "categorization" irrespective of whether this mapping is binary or graded (e.g., even if these people differ in the degree to which each is perceived as a "man"). Finally, the *grouping* definition is also different from the *organization* definition (Definition 3). Under the *organization* definition (Definition 3), "categorization" entails organizing the properties of another person by one representation, which is different from grouping. For example, suppose that the observable properties of a person (e.g., blue eyes, blond, and actor) are better organized by an exemplar representation (e.g., Brad Pitt) than a group representation (e.g., man). In that case, representing the person in terms of the exemplar representation (this is "Brad Pitt") would constitute "categorization" under the *organization* definition but not under the *grouping* definition.

These conceptual differences are also reflected in theoretical conclusions from empirical findings. In particular, evidence that social perceivers fail to (correctly) distinguish between members of social groups has been taken as evidence of "categorization" under the *grouping* definition. For example, when asked to retrieve the speaker of a statement, people tend to confuse speakers more frequently within currently salient social groups (e.g., a man with another man) than between these social groups (e.g., a man with a woman; Gawronski, Ehrenberg, Banse, Zukova, & Klauer, 2003; Taylor et al., 1978; for an overview, see Klauer & Wegener, 1998). This is a robust finding (Klauer & Wegener, 1998), which is consistent with the idea that we tend to treat people as interchangeable group members (i.e., "categorization" under the *grouping* definition).

Importantly, the interpretation of such findings depends again on the employed definition. Under the *representing* definition, any kind of representing another person constitutes "categorization," including storing an exemplar representation of the speaker of a statement. Consequently, even correctly remembering the speaker of a statement could be seen as evidence of "categorization" under the *representing* definition. In contrast, remembering the speaker of a statement is usually not seen as evidence of "categorization" under the *grouping* definition (Klauer & Wegener, 1998). Hence, the theoretical conclusions from these findings differ dependent on whether one adopts the *grouping* or *representing* definitions.

The interpretation of these findings also differs between the *grouping* and *dichotomization* definitions. Under the *dichotomization* definition, one speaks of "categorization" if and only if there is an all-or-none mapping of the perceived person onto an internal representation. The finding of higher within-group than between-group confusions between speakers suggests that group members may have been mapped onto the same internal representation (e.g., "man") but does not necessarily imply that this is an all-or-none mapping (people may still perceive some speakers as better exemplars of "men" than others). In fact, when interpreted together with existing evidence of graded mappings

in the literature (e.g., Blair et al., 2002; Freeman, Ambady, Rule, & Johnson, 2008; Mervis & Rosch, 1981), it seems more plausible that groupings were based on graded mappings (e.g., several speakers fit to the representation "men" but to varying degrees). Under the *dichotomization* definition, this would mean that speakers were not "categorized." In contrast, under the *grouping* definition, the same interpretation would mean that speakers were "categorized."

Finally, the interpretation of the findings above is also different depending on whether one adopts the *grouping* or *organization* definition. To illustrate this, consider the findings that speakers with similar colors of clothing (Brewer, Weber, & Carini, 1995) and speakers who are assigned to the same arbitrary groups (Judd & Park, 1988) are more often confused with each other. These findings support the idea that these speakers were represented as interchangeable group members. Hence, under the *grouping* definition, these findings support the conclusion that the speakers were "categorized." In contrast, it seems implausible that color of clothing and arbitrary groupings organize the observed properties of a person best ("categorization" under the *organization* definition). Almost by definition, an arbitrary grouping should be uncorrelated to the properties of a person, which means that distinguishing between people based on an arbitrary grouping would not constitute "categorization" under the *organization* definition. Hence, whether or not the findings above can be seen as evidence of "categorization" again depends on the employed definition of "categorization."

3.1 | Applying the conceptual analysis to open questions

Earlier, we introduced three existing open questions in the person perception literature that are relevant to our conceptual analysis. First, there are seemingly antagonistic viewpoints regarding the question of whether or not "categorization" is an inevitable part of person perception (Macrae & Bodenhausen, 2000). Second, there is ambiguity regarding the question of how frequently social perceivers rely on "categorization" during person perception (assuming that "categorization" can be avoided in principle). Third, it has been argued that the distinction between categorical and non-categorical processes is artificial and may be better avoided (Cox & Devine, 2015; Kunda & Thagard, 1996). In the following, we will discuss how disentangling the four discussed definitions (see Table 1) may help to address these issues.

3.1.1 | Is categorization inevitable?

In Allport's seminal writings on the role of categorization in person perception, he argued that "the human mind must think with the aid of categories […]. We cannot possibly avoid this process" (Allport, 1954, p. 21; see also: Bargh, 1999). However, the view that "categorization" is an inevitable part of person perception has been questioned based on findings that "category" activation is moderated by processing goals and resources (Macrae et al., 1997; Macrae & Bodenhausen, 2000). As a result, there are seemingly antagonistic viewpoints about the question whether "categorization" is an inevitable part of person perception (Allport, 1954; Bargh, 1999) or a processing strategy that is endorsed only under specific conditions (Macrae et al., 1997; Macrae & Bodenhausen, 2000).

Our conceptual analysis suggests that these viewpoints could reflect different usages of the term "categorization" rather than truly antagonistic positions. Under the *representing* definition, "categorization" constitutes the general process of mapping external stimuli onto internal representations. Virtually every person perception model assumes that people represent other people in some sense (e.g., Brewer, 1988; Ehret et al., 2014; Fiske & Neuberg, 1990; Freeman & Ambady, 2011; Greenwald & Banaji, 1995; Hugenberg et al., 2010; Kunda & Thagard, 1996; Smith & DeCoster, 1998; Zebrowitz et al., 2003). As such, "categorization" does appear inevitable under the *representing* definition. Allport's strong claim that thinking in general requires categories (i.e., that there does not exist any non-categorical thinking) suggests that he adopted the *representing* definition.

By contrast, under Definitions 2–4, "categorization" constitutes a mapping of external stimuli onto a specific set of internal representations (all-or-none representations, organizing representations, or group representations) that are distinguished from non-categorical representations. Consequently, "categorization" can in principle be

avoided under Definitions 2–4 by construing other people in terms of non-categorical representations (graded dimensions/attributes/exemplars). It seems likely that researchers who argued that "categorization" is conditional rather than inevitable adopted one of these (or similar) definitions. This is evident in the interpretation of findings as evidence for the conditional nature of "categorization." These findings usually show that certain social representations (e.g., gender) have not become more activated in a certain situation. This indicates that *those particular* mental representations have not been mapped onto the perceived person in this particular situation (Macrae et al., 1997; Macrae & Bodenhausen, 2000). By contrast, these findings do not rule out that the other person has been mapped onto *some* internal representation and thus that perceivers "categorized" under the *representing* definition.

Taken together, the two viewpoints above may not be truly antagonistic. Researchers who adopted the viewpoint that "categorization" is an inevitable part of person perception may have intended to suggest that mapping external stimuli onto internal representations (Definition 1) is an inevitable part of person perception. In contrast, researchers who adopted the viewpoint that "categorization" is a conditional processing strategy may have intended to suggest that dichotomizing, organizing, or grouping (Definitions 2–4) or other more specific cognitive strategies are conditional.

3.1.2 | How frequently do people rely on "categorization"?

If "categorization" is one of several possible processing strategies, an important question is how frequently social perceivers employ this strategy. Unfortunately, the existing literature does not give an unequivocal answer to this question. While the more traditional view is that "categorization" is a frequently employed default (Brewer, 1988; Fiske, Lin, & Neuberg, 1999; Fiske & Neuberg, 1990), some researchers have noted that "categorization" may be erelatively rare (Krueger & Rothbart, 1988), and findings emerged that could suggest that non-categorical processes may be more common than originally assumed (Blair et al., 2002). As a result, it remains relatively ambiguous what the conclusion is regarding the frequency with which people "categorize."

Again, we suggest that part of the ambiguity may be due to different usages of the term "categorization." As we already noted, "categorization" seems to be an inevitable aspect of person perception under the *representing* definition (Definition 1) while Definitions 2–4 leave room for the possibility that social perceivers may not always "categorize." However, even among Definitions 2–4, different answers arise for the question of how frequently people rely on categorization. This is most apparent when comparing the *dichotomization* to *grouping* definition. As we mentioned above, there is considerable evidence that social perceivers employ graded (rather than binary) representations in various settings and tasks (Blair, Chapleau, & Judd, 2005; Blair, Judd, & Fallman, 2004; Freeman & Ambady, 2011; Mervis & Rosch, 1981). These findings suggest that people rarely "categorize" *under the dichotomization definition*. At the same time, there is also considerable evidence that people often do not distinguish between members of social groups (Gawronski et al., 2003; Taylor et al., 1978; for an overview, see Klauer & Wegener, 1998). Moreover, there is robust evidence that social perceivers judge other people not only in terms of individualized knowledge but also in terms of stereotypes about social groups (Jussim, 1991; Smith & DeCoster, 1998). These findings suggest that people tend to represent other people as interchangeable group members. This means that they may frequently "categorize" *under the grouping definition*.[4]

In sum, while there is considerable evidence that social perceivers "categorize" rarely *under the dichotomization definition*, there is also considerable evidence that social perceivers "categorize" frequently *under the grouping definition*. Consequently, ambiguity about the frequency with which people "categorize" may not necessarily be due to conflicting empirical findings but could also be due to different usages of the term "categorization." That is, what may appear to be conflicting conclusions (e.g., people frequently "categorize" vs. people rarely "categorize") may be compatible conclusions (e.g., people rarely dichotomize information but frequently group other people).

3.1.3 | Is the distinction between categorical and non-categorical useful?

Several researchers have noticed that there are seeming contradictions in the way researchers have distinguished "categorization" from other hypothetical cognitive strategies (Cox & Devine, 2015; Kunda & Thagard,

1996; Quinn & Macrae, 2005). As a result, such distinctions have been declared artificial (Cox & Devine, 2015), and it has been proposed that models that do not make the distinction are to be favored (Kunda & Thagard, 1996). Despite this criticism, the distinction between categorical and non-categorical processes has remained widespread in the person perception literature (Hugenberg et al., 2010; Macrae & Bodenhausen, 2000). As such, there appear to be different viewpoints about the scientific value of the distinction between categorical and non-categorical processes.

Again, these viewpoints may partially be the result of different usages of the term "categorization." For example, Kunda and Thagard (1996) noticed that "categories" are defined as group representations (i.e., the *grouping* definition) and that personality traits are not seen as "categories" by many researchers (for an overview, see Kunda & Thagard, 1996). They argued that this appears to be untenable given that people can be grouped based on virtually any property—including personality traits (e.g., the group of intelligent, trustworthy, or extravert people). As such, there appears to be no reason why personality traits should not be seen as "categories" (here, understood as "groupings") and thus why mapping a person onto personality trait should not be seen as "categorization." In line with this point, we recently found evidence that people spontaneously group other people based on personality traits (Klapper, Dotsch, van Rooij, & Wigboldus, 2016).

Nevertheless, notice that Kunda and Thagard assessed the practice of treating personality traits as non-categorical representation under the *grouping* definition. Indeed, under this definition, there seems to be no clear reason why a personality trait should not be seen as a "category." However, under the *dichotomization* definition, any graded representation is not a category and the treatment of personality traits as non-categorical representation therefore seems appropriate. A similar point applies to the *organizing* definition under which a representation that has many associations with other observed properties of a person is a "category." Under this definition, the findings that personality traits are relatively ineffective sources of person inferences are consistent with the treatment of personality traits as non-categorical representations (Andersen et al., 1990; Andersen & Klatzky, 1987; Bond & Brocket, 1987; Fiske & Neuberg, 1990).

Taken together, it seems that researchers who treated personality traits as non-categorical representations did not necessarily intend to suggest that personality traits are not group representations (Definition 4). Instead, they may have intended to suggest that personality traits are graded representations (Definition 2) or representations that do not organize observed person properties (Definition 3). As such, the seeming contradiction between explicit definition (e.g., "categories" are group representations) and usage of the term "categories" (e.g., personality traits are not "categories") may not be a real contradiction. Instead, it may reflect that the term "categories" has been used with different underlying meanings.

A similar point can be made for criticism that was raised by Cox and Devine (2015). They discussed the view that categorical representations are more effective sources of person inferences than non-categorical representations (which fits best to the *organizing* definition). They collected a pool of person properties that had been labeled as "categories" and a pool of person properties that had been treated as non-categorical representations by researchers in the person perception literature. Next, they tested how effectively people can infer person characteristics from these labels.[5] They found that the presumed "categories" were not consistently more effective sources of person inferences than the presumed non-categorical representations and that this challenges traditional categorization models (Cox & Devine, 2015). They argued that the presumed "categories" do not appear different from the presumed non-categorical representations and that the distinction between categorical and non-categorical representations may be better avoided. However, it seems likely that many researchers who distinguished between categorical and non-categorical representations did not intend to suggest that the former is a more effective source of person inferences than the latter (which belongs to the *organizing* definition). Instead, they may have intended to suggest that one is presumably dichotomous and the other presumably graded (the *dichotomization* definition) or that one is a group representation and the other an individual representation (the *grouping* definition).

What can we conclude from this? In our view, the problem is not necessarily that the distinction between categorical and non-categorical representations is devoid of any coherent (Kunda & Thagard, 1996) and empirically

supported meaning (Cox & Devine, 2015). Instead, the problem may be that several different meanings are attached to it, and that these meanings are usually confounded in the literature. This is a qualitatively different problem than suggested in past criticism, which requires a different solution. Namely, rather than rejecting the distinction between categorical and non-categorical a more constructive approach may be to disentangle the different meanings that are attached to these distinctions and discuss them separately in future research. For example, rather than asking "should we label personality traits as categories?" we may adopt the *grouping* definition and ask "do people group other people based on personality traits?" While there is no clear approach to answer the former question, the latter question could be answered by investigating whether people tend to confuse other people who possess similar personality traits (and we recently found evidence that they do; Klapper et al., 2016). In general, by adopting specific definitions of "categorization," relatively intangible conceptual questions could be turned into more tangible empirical questions. We hope that our conceptual analysis provides the conceptual foundation for this.

3.2 | Sharpening the relationship between theory and data

A general problem that we hope to alleviate with our conceptual analysis is that the relationship between theory and empirical findings gets blurred if different definitions are confounded. This blurring can have important consequences. First, if different definitions are confounded under the same label, empirical evidence may be allocated to the wrong theoretical hypothesis. For example, recall from our discussion of the *dichotomization* definition that sometimes the assumption has been adopted in the literature that representing a person by race entails an all-or-none mapping. This assumption has been adopted, although there is considerable evidence that mappings of people onto internal representations tend to be graded. This may be due to a misallocation of evidence. For example, based on the literature, it appears that there is widespread agreement that "people tend to categorize" and without disentangling the confounded definition this can appear as agreement that "people tend to dichotomize." As a result, a hypothesis that is not well supported by empirical findings ("people dichotomize") can spuriously appear well supported. Hence, confounding definitions of theoretical constructs creates the danger of confounding evidence for theories.

Second, a blurred relationship between theory and empirical findings also makes it hard to falsify theories. Counter-evidence usually applies only under one specific definition of "categorization" and can therefore be discredited by adopting another definition. For example, most researchers may not think that evidence for graded mappings is evidence against "categorization" because it is evidence against "categorization" only under the *dichotomization* definition. A similar point can be made about the finding that person properties that researchers have labeled as "categories" are not generally more effective sources of inferences than person properties that researchers have treated as non-categorical representations (Cox & Devine, 2015). This finding is problematic if the main idea behind the distinction is that the presumed "categories" are more effective sources of inferences. However, most researchers may not make the distinction between categorical and non-categorical representations with the idea in mind that categorical representations are more effective sources of inferences (which belongs to the *organization* definition). As a result, the findings by Cox and Devine may be perceived as irrelevant by many researchers. In general, most conceivable findings that would challenge that there is a distinction between categorical and non-categorical representations under one definition are likely to be irrelevant under other definitions and therefore prone to be discredited. This makes the theoretical assumptions that are underlying such distinctions relatively immune to falsification as long as the definitions remain confounded.

To conclude, confounding different definitions of "categorization" can distort conclusions from the empirical literature in multiple ways and thereby makes an empirical discussion about the theory (e.g., in an empirical review) relatively intangible. In all cases, the key to preventing the problem is to properly disentangle existing definitions. We hope that our conceptual analysis has contributed to this aim.

4 | CONCLUSION

The notion of "categorization" has been widespread in the person perception literature for decades. However, the term "categorization" has been used with qualitatively different meanings, which can give rise to spurious disagreement. A main cause of such problems is that confounding these definitions blurs the relationship between theory and empirical findings. Consequently, it is vital for scientific debates to explicate and disentangle the different definitions that are employed in the literature. We hope that our conceptual analysis has contributed to this aim and helps to further advance the clarity, and general quality of the field's pivotal theories.

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ENDNOTES

[1] Sometimes the terms "concepts" and "categories" have been distinguished in the sense that the "concept" is an internal representation (e.g., pen) while the "category" refers to the corresponding class of stimuli that are treated as equivalent under the concept (e.g., *x*, *y*, and *y* are each a pen). Researchers who use the terms in this way would not say that the concept *is* a category but that it *has or refers to* a category. More variants exist, but importantly they agree on the point that all internal representations are/have categories—contrary to the subsequent definitions we discuss.

[2] Exceptions to this view can be found in non-representationalist camps in cognitive science (e.g., van Rooij, Bongers, & Haselager, 2002; van Gelder, 1995; but see Haselager, de Groot, & van Rappard, 2003). Yet, to our knowledge, no non-representational accounts of person perception have been put forth to this date.

[3] In their continuum model, Fiske and Neuberg (1990) proposed also that there may be processing strategies that fall in-between a purely category-based and attribute-based strategy (e.g., sub-categorizing). Although this idea is of theoretical importance, it is not directly relevant for the question of how "categorization" is defined in their model. For the sake of simplicity, we illustrate their definition of "categorization" by focusing on the main distinction between purely category-based and attribute-based processing.

[4] To our knowledge, there has not been much systematic research that addressed the question to what extent people tend to "categorize" under the *organization* definition (but see Fiske et al., 1987). Moreover, answering this question is relatively complicated given that it is relatively ambiguous what can be counted as "categorization" under Definition 3. For example, whether representing another person as an actor counts as "categorization" depends on whether the representation "actor" organizes the other features of the person, and it is not always clear in empirical studies whether that is the case. As such, it is relatively ambiguous to what extent people "categorize" under Definition 3.

[5] The argument above is somewhat simplified. The way Cox and Devine interpreted the distinction between "categories" and non-categories was similar to the *organization* definition but not entirely equivalent. Namely, they adopted the interpretation that "categories" differ from "non-categories" in the sense that associative links are stronger in the direction from "categories" to "non-categories" than from "non-categories" to "categories." Above, we treat this interpretation as a variant of the *organization* definition.

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APPENDIX A

Below, we provide for each definition a list of quotations from the literature where the respective definition has been implicitly or explicitly adopted. However, we advise some caution with interpreting the authors of these statements as "proponents" of the respective definitions. Definitions serve mainly communicative purposes, and therefore an author who uses it does not necessarily adopt it personally. The purpose of the list the quotations below is exclusively to show that the definitions exist (for one reason or another) in the writing in the literature. For this purpose, we list quotations from selected sources that have been influential and widely cited in the literature.

A.1 | Representation definition (Definition 1)

- "*Categorization*. This function involves determining that a specific instance is a member of a concept" (Smith & Medin, 1981, p. 6).
- "The human mind must think with the aid of categories […].We cannot possibly avoid this process." (Allport, 1954, p. 21). Note: The claim here is that the human mind generally requires categories. This claim fits exclusively to the *representing* definition given that other definitions assume that there exist non-categorical processing styles.

A.2 | Dichotomization definition (Definition 2)

- "In a rather formal way, the problem of stereotypes is that of the relation between a set of attributes which vary on *continuous* dimensions and classifications [here, used interchangeably with 'categories'] which are *discontinuous*" (Tajfel, 1969, pp. 177–178, emphasis added).
- "As noted previously, it is much more difficult to adjust one's judgments in response to *continuous* cues rather than a *dichotomous* cue, such as racial category" (Blair, Judd, & Fallman, 2004, p. 774, emphasis added). Note:

In the discussed experiment, participants saw faces that gradually varied in how African American they looked while true race was not disclosed—as such, it seems to be assumed here that the racial "category" is a dichotomous representation in the mind of the participants.

- "Categorization models of stereotyping tend to assume that category members will be stereotyped *to the same degree*, regardless of their features" (Blair, Judd, & Fallman, 2004, p. 763, emphasis added). Note: This is a description of categorical processing (under Definition 2).
- "With feature-based stereotyping, individuals who are categorized as members of the same group may be stereotyped and discriminated against *to different degrees*" (Blair, Judd, & Fallman, 2004, p. 763, emphasis added). Note: This is a description of non-categorical processing (under Definition 2).
- "The *continuous* nature of the features would make their strategic use much more difficult" (Blair, Judd, & Fallman, 2004, p. 768; emphasis added). Note: Here, the dichotomization definition motivated the prediction that categorization is cognitively more efficient than feature-based stereotyping based on the idea that categorization is not continuous.

A.3 | Organization definition (Definition 3)

- "A *category* label is any feature that best *organizes* the other features. More specifically, the label is that feature with the strongest and most frequent associations to each of the other features" (Fiske et al., 1987, p. 401; emphasis added)
- "The feature [/attribute] that a perceiver uses to *organize* and understand the remaining features *defines* the category […]" (Fiske & Neuberg, 1990, p. 9, emphasis added).
- "The category label has *more and stronger links* to the attributes than any single attribute has to the other attributes; hence the category label can be said to *organize* the attributes" (Fiske & Neuberg, 1990, p. 9, emphasis added).
- "In general, the category labels are most likely to be those features that generate relatively rich but distinct inferences" (Fiske et al., 1987, pp. 401–402). Note: Here, the *organization* definition motivates the reasoning that the inferential productiveness of a representation is evidence of its status as a "category."
- "The category label is more likely to be a social grouping (demographic category, role, job) than a single personality trait. Recent research demonstrates the greater distinctiveness, richness, and vividness of social stereotype groupings compared to traits (Andersen & Klatzky, 1987), as well as their superior efficiency in cuing memory for acquaintances (Bond & Brocket, 1987). Accordingly, they are likely candidates for organizing a targets other features" (Fiske & Neuberg, 1990, p. 10). Note: Another example how the *organization* definition motivated the reasoning that the inferential productiveness of a representation is evidence of its status as a "category."

A.4 | Grouping definition (Definition 4)

- "Categorization refers to people's propensity to characterize others on the basis of the social groups to which they belong (e.g. men, senior citiczens). […] Individuation, in contrast, reflects the tendency to view other people not as members of distinct social groups, but rather as unique entities" (Mason & Macrae, 2004, p. 1785).
- "In brief, individuation is the act of discriminating among exemplars of a category (e.g., discriminating among letters in an alphabet; Wong, Palmeri, & Gauthier, 2009). Categorization, however, is the act of classifying exemplars into a group along shared dimensions (e.g., classifying symbols as letters)" (Hugenberg et al., 2010, p. 1170).
- "The term category is commonly used to describe the totality of information that perceivers have in mind about particular classes of individuals (e.g. Germans, plumbers, pastry chefs)" (Macrae & Bodenhausen, 2000, p. 96). Note: This is a variant of the *grouping* definition. Nevertheless, the defining property of a category is still that it is in some way about social groups.
- "In person perception research, the term category is used to describe the totality of information that perceivers have in mind about various groups of individuals (e.g. Italians, doctors, blondes)" (Macrae & Bodenhausen, 2001, p. 243). Note: This is the same variant of the *grouping* definition as above.