

The Distinctiveness Problem of Analogical Arguments

Abstract: The orthodox view thinks that analogical arguments are a distinctive type of argument, while the eliminative view thinks that analogical arguments can be reducible to non-analogical arguments. This paper argues that the existing defense for the orthodox view fails to resist the attack of the existing and the enhanced eliminative views. Moreover, this paper contends that there are two types of analogical arguments: (a) Analogical arguments containing conductive arguments and principle-based arguments; (b) Analogical arguments containing IBE and principle-based arguments. These two types of analogical arguments are distinctive types of arguments, so the orthodox view can be well defended.

Keywords: analogical arguments, analogy, similarities, conductive arguments, inferences to the best explanation

1. Introduction

Analogical arguments (analogies) are usually viewed as one of the most important types of arguments.¹ There are different structures of analogical arguments proposed by scholars with different backgrounds (e.g., Hesse 1966, Walton 2008, Bartha 2010, etc.). Although there are various versions of the structure of analogy, they are likely to *presuppose such a fundamental principle*: the similarities between two objects are the key feature of analogical arguments. In this regard, an argument scheme presented by Walton, which concisely expresses this principle, can probably be regarded as the fundamental structure of analogy (2008, p. 56):

Major Premise: Generally, case C_1 is similar to case C_2 .

Minor Premise: Proposition A is true (false) in case C_1 .

Conclusion: Proposition A is true (false) in Case C_2 .

By convention, C_1 is called “the analogue,” C_2 is called “the primary subject,” and this paper called the major premise “the similarities proposition.” As a necessary premise, the similarities proposition represents the logical role of similarities between two cases in analogical arguments. Various versions of the structure of analogy, which illustrate the similarities proposition in more precise and systematic manners (e.g., by computational theory), can be seen as the extended versions of Walton’s scheme above. There might be deep disagreements on the specific structure of analogy, but most theorists seem to concur that the similarities are the *foundation* of the structure. In other words, most theorists agree that the presence of the similarities proposition *differentiates* analogical arguments from other types of arguments, such as arguments from expert opinions, abductive arguments, and causal arguments. Arguably, there is *an orthodox view* that analogical arguments are *a distinctive type* of argument.

However, some theorists argue that the similarities proposition only has an epistemic function but not a logical function so that the similarities proposition can be *eliminated* (Agassi 1988; Waller

¹ Analogies have different functions, such as argumentative, explanatory, and descriptive functions, but this paper intends to focus on the argumentative function (i.e., analogical arguments). In this paper, “analogy (analogies)” refers to analogical arguments unless otherwise noted.

2001; Kaptein 2005). They think that the similarities of analogy only lead people to figure out certain underlying principles (i.e., the epistemic function), and the similarities of analogy do not provide support for the conclusion (i.e., the logical function). It means that the proposition differentiating analogical arguments from other types of arguments could be removed from the structure of analogies, which brings a significant challenge to the orthodox view. It is called “*the eliminative view*” in this paper. To defend the orthodox view, theorists criticize the eliminative view and argue that the underlying principle is not a premise in the logical structure of analogy. The dispute of the logical function of the similarities proposition determines the distinctiveness of analogy; thus, this paper calls it “*the distinctiveness problem of analogical arguments*,” which is a fundamental issue in the reconstruction of the structure of analogy. In the dispute, I think that the defenders of the orthodox view *fail* to refute the eliminative view, while the eliminative view could be further *enhanced*. Given this, it makes sense to say that the distinctiveness problem has not yet been solved and posed a risk to the logical foundation of analogy. The orthodox view needs a new defense.

2. The Challenge from the Eliminative View

The main idea of the eliminative view is that the similarities of analogy merely have the epistemic function in the sense that they merely lead the arguers to think about underlying principles. Agassi thinks that the fascination of analogy is its “heuristic,” which means a technique to “jog the intellect to make wild hypotheses.” The similarities of analogy sometimes are vague and indefinite, but he contends that they can “stimulate one’s thinking (1988, pp. 403-404).” In this regard, Waller comes up with an argument by taking the violinist analogy in ethics as an example.

Is it morally wrong to prohibit a woman who is pregnant due to rape from having an abortion? For people in certain cultures, the issue of abortion might be highly controversial. To help people make a judgment, we can first consider the so-called violinist analogy. The violinist analogy can be briefly stated: One morning, you wake up to find that you have been kidnapped and are in a hospital now. You are lying in a bed next to a famous but seriously ill violinist, and your two bodies are connected. The violinist is suffering from acute kidney failure, and if her blood is not purified, the toxins in her blood will soon kill her. Music fanatics somehow find out that you are currently single and that your blood type is an exact match for the violinist, so they kidnap you and connect your body to the violinist. Now your kidneys have a double responsibility: to purify your blood and the blood from the violinist. This process will last about nine months and will cause inconvenience but no harm to your body. If you disconnect from the violinist now, she will die. Given this, the fanatics will force you to stay connected to the violinist to save her life (Waller 2001, p. 201).

Is what the fanatics will do morally wrong? Most probably think so because forcing someone to save the other is simply unacceptable. This is a much easier decision than deciding on the abortion case. Importantly, if you think such compulsion is morally wrong, you should conclude that it is immoral to prohibit a pregnant woman due to rape from having an abortion *for the same reason*. This is an analogical argument in ethics. Nevertheless, how exactly does the argument work? Waller reconstructs the argument as follows (ibid.):

1. We both agree with case *a*.

2. The most plausible reason for believing *a* is the acceptance of principle *C*.
3. *C* implies *b* (*b* is a case that fits under principle *C*)
4. Therefore, consistency requires the acceptance of *b*.

According to Waller's structure above, "case *a*" (the analogue) refers to the violinist case, and "b" refers to the abortion case. Premises 2 and 3 show that case *a*'s function lies in stimulating the arguer to find principle *C* that implies *b*. For the violinist case, Waller thinks that the principle might be that "we do not have an obligation to save or sustain a life when we have done nothing to take on the obligation." The arguer can imply that a woman who is pregnant due to rape does not have an obligation to continue her pregnancy (i.e., it is immoral to force her to keep her pregnancy) based on the principle. Obviously, there is no similarities proposition in Waller's structure. The similarities between the violinist and abortion cases give the arguer a clue to discover the underlying principle, but they do not become a premise in Waller's structure. Thus, the similarity proposition is eliminated in Waller's structure.

In addition to analogy in ethics, analogy in law can also be analyzed by the eliminative view. Kaptein thinks that the similarities proposition belongs to "the realm of heuristics and rhetoric" but has nothing to do with the justification of argument (2005, p. 501). He elaborates this point by illustrating the *Adams v. New Jersey Steamboat Co.* case. One morning, a male passenger on a steamboat woke up to find that he had lost his money in the cabin. He sued the steamboat company for damages. The court ordered the company to pay because the steamboat case was similar to the inn case (i.e., a case confirming that innkeepers are liable for residents' belongings). In Kaptein's opinion, the key in the legal reasoning here is nothing but the underlying principle, namely the principle that "if there is a general duty or obligation of care on parties offering night accommodation, then both innkeepers and steamboat companies are under such a duty or obligation. (ibid.)" As for the similarities between the two cases, they are mere "a suitable starting point from a purely heuristic point of view," so they are redundant in the logical structure of analogy (2005, p. 502).

Some people probably think that analogies in ethics and law belong to *deductive analogies* (Waller's term) or *a priori analogies* (Govier's term), but there is another type of analogy—inductive analogies. Can inductive analogies escape from the attack of the eliminative view? They cannot. The structure of inductive analogies can be represented as follows (Waller 2001, p. 202):

1. *D* has characteristics *e, f, g, and h*.
2. *E* also has characteristics *e, f, g, and h*.
3. *D* also has characteristic *k*.
4. Having characteristics *e, f, g, and h* is relevant to having characteristic *k*.
5. Therefore, *E* will probably also have characteristic *k*.

Premises 1 and 2 here illustrate the similarities between cases, which can be reformulated as "*D* is similar to *E* in terms of characteristics *e, f, g, and h* (call it '1*')". 1* functions as the similarities proposition (i.e., the major premise in Waller's structure), and 3 as the minor premise in Waller's structure. According to the eliminative view, the function of 1* and 3 is to stimulate the arguer to

figure out the principle (i.e., premise 4). As a result, inductive analogies also can be reducible to non-analogical arguments with principles.²

I have shown that deductive (or a priori) and inductive analogies can be reducible to non-analogical arguments. The main advantage of the eliminative view is that it makes argument analysis and evaluation clearer. The similarities between cases are vague, indefinite, or “unanalyzed” (Gamboa 2008, p. 233), so the argument analysis and evaluation would have to rely on “rough intuitions (Waller 2001, p. 210).” On the contrary, the underlying principle is clear and definite so that the evaluator has a better understanding of the inferential link of the argument. In particular, the advantage of Waller’s structure would be highlighted when we need to compare an analogical argument and its counter-analogy, such as Thompson’s violinist analogy versus Fischer’s starveling analogy (ibid., p. 209). Compared to rough intuitions between these two conflicting arguments, it is much more understandable and manageable for the evaluator to analyze and compare two underlying principles. Therefore, the similarities between cases are not qualified to bear the logical function in analogical arguments while the underlying principle is up to the task.

We can conclude that the eliminative view presents a severe challenge to the logical foundation of analogy by eliminating the logical position of the similarities proposition and reconstructing the structure of analogy as a principle-based structure (e.g., Waller’s structure). If the similarities proposition loses its logical role in analogical arguments, analogical arguments will not be a distinctive type of argument but be reducible to non-analogical arguments, namely arguments from principle.

3. The Defense for the orthodox view and the Enhanced Eliminative View

The eliminative view attacks the orthodox view by denying the logical position of the similarities proposition while justifying the underlying principle instead. In defense of the orthodox view, on the contrary, theorists try to attack the legitimacy of the underlying principle and justify the logical position of the similarities proposition. I do not intend to discuss all defenses, but only a few of them that are representative.

First, the eliminative view does not meet the arguer’s original intention, which means that the principle-based reconstruction mentioned is unfair to the arguer. Govier (1989, 2002) thinks that when an arguer comes up with an analogical argument, the arguer simply intends to reason from one case to another without committing herself to a universal or general claim, namely the underlying principle. Moreover, she says that arguers usually sense important resemblances between cases without being able to specify them clearly, which is “the trick and charm” about analogies (1989, p. 148). According to his teaching experience about analogies, Guarini (2004, p. 156) finds that some students are persuaded by analogical arguments but not prepared to endorse any principle because they “simply lose interest in generating and testing moral principles.” He insists that even though the underlying principles might play a role in the theory of analogical arguments, it does not follow that they could be ascribed as premises in an argument reconstruction (2004, p. 157). In my

² Although the dispute of classification of analogical arguments is beyond the scope of this paper, it is plausible to say that the principles in inductive arguments are empirical while the principles in deductive or a priori analogies are a priori. Besides, the reducibility of inductive analogies implies that Guarini’s structure of analogical arguments (2004, p. 161) fails to resist the attack of the eliminative view as well.

view, it makes sense to say that arguers do not figure out principles when they come up with analogical arguments in the beginning, as Govier and Guarini argued. However, it does not follow that the principle-based reconstruction goes against their original intention.

Imagine someone who advocates the eliminative view and responds to the above criticism. The similarities between cases are just a heuristic that is helpful to think out the underlying principle that is, in effect, a premise of the argument. Thus, the similarities proposition is not really a premise in the analogical argument, but the underlying principle is. The analogical argument without specifying the underlying principle (i.e., the “argument” lacks one of the necessary premises) is not really an argument but a *pre-argument* in the sense that it remains to be developed to be an argument by generating the underlying principle. Accordingly, the arguer’s intention in the stage of pre-argument is vague and developing. Once the arguer specifies the underlying principle based on the similarities between cases, she will be ready to raise a genuine argument, namely a principle-based argument. Therefore, the fact that arguers do not figure out principles merely happens in the stage of pre-argument, while the arguers have already specified the principle in their minds when they come up with analogical arguments (i.e., after the stage of pre-argument). In this way, the eliminative view would not go against the arguer’s original intention. Instead, it helps us to clarify the arguer’s intention.

Second, the eliminative view is unfeasible in argument reconstruction because the underlying principle is generally hard to formulate: (a) Arguers generally understand similarities between cases better than the underlying principle that they often have trouble articulating clearly (Govier 1989, p. 149; Botting 2012, p. 113); (b) The similarities explicated by analogical arguments probably do not provide evaluators with enough material to obtain the principle (Stevens 2016, p. 61). However, these two points can be resolved by the eliminative view: (a) As Waller (2001, p. 205) said, it is undoubtedly hard to formulate the underlying principle as critical thinking should not be easy. As a type of rational activity, it is unquestionable that argumentation emphasizes the use of critical thinking, and it follows that it would *not be easy* to be an arguer. Even if the arguer has difficulty articulating the principle, she should try to do more critical reflection to gain the principle from similarities between cases if she wants to be a *qualified arguer*. In other words, the difficulty in specifying the principle, which the arguer should overcome, should not be an excuse for the arguer to lower her standards. (b) Some analogical arguments might provide very limited information for evaluators if we assume they do argument analysis from a static perspective. This assumption, however, is problematic given that the dominant view in the field of argumentation is to see an argument as a dialogue between the arguer and the audience (e.g., argument schemes theory, pragma-dialectics, etc.). Evaluators are supposed to analyze arguments from a dynamic (i.e., dialogical) perspective. By engaging in dialogue, evaluators could get more information to determine the principle and help arguers to clarify the principle.³

Third, the eliminative view gives a deductive account of analogical arguments, thereby making

³ Shecaira (2013, p. 420) argues that Waller’s structure (i.e., the eliminative view) fails to capture the structure of analogical arguments that do not list relevant similarities (he calls them “bare analogies”), such as “Having sex with people with severe mental retardation is like having sex with children. It is morally unacceptable.” I think that Shecaira’s argument here relies on an unacceptable assumption that argument analysis should be based on static rather than a dynamic perspective. From the dynamic perspective, it is plausible to say that bare analogies can also be reconstructed as principle-based arguments after further dialogical interaction.

analogical arguments not capturing varying degrees of argument strength (Govier 2002, p.156; Guarini 2004, pp. 156-161). In other words, the eliminative view turns all analogical arguments into deductive arguments. Shecaira argues that Guarini misunderstands the move from 1 to 2 in Waller's structure (i.e., a deductive account of analogical arguments) as the strength of analogical arguments will vary according to the plausibility of 2 in Waller's structure (2013, pp. 427-429). Following Toulmin's conception of inference and a Toulmin-inspired account of argument evaluation, Bermejo-Luque (2012) contends that certain analogical arguments can be "deductive but defeasible." I agree with Shecaira's insights, but he seems to overlook another sense of argument strength (call it "the narrow sense of argument strength") which refers to the inference strength only measuring the supporting degree from the premises and the conclusion. The argument strength Shecaira uses refers to the broad sense of the argument strength, which consists of the inference strength and the acceptability of the premises. Nevertheless, Bermejo-Luque's argument is concerned about the narrow sense of argument strength, and he tries very hard to justify a seemingly self-defeating claim that an argument can be deductive but defeasible by applying Toulmin's framework. His argument is undoubtedly interesting and inspiring, but it assumes a clear distinction between the warrant and the implicit premise. That will likely involve controversies in the relationship and distinction between warrants and premises. It would be beyond the scope of this paper to discuss the controversies.

Unlike Shecaira and Bermejo-Luque, I contend that the eliminative view does not necessarily lead to a deductive account of analogical arguments, even though theorists tend to view the eliminative view implies a deductive account of analogical arguments (e.g., Govier 1989, 2002; Waller 2001; Guarini 2004; Bermejo-Luque 2016; Shecaira 2013, Stevens 2016). So, how is it possible that a principle-based argument is not a deductive argument? To answer this question, I need to introduce a distinction between strict and defeasible modus ponens proposed by Verheij (2000, as cited in Walton 2005):

Strict Modus Ponens (SMP)

As a universal rule not subject to exceptions, if *A* then *B*.

A is true.

Conclusion: *B* is true.

Defeasible Modus Ponens (DMP)

As a rule subject to exceptions, if *A* then *B*.

A holds as true.

It is not the case so far that there is a known exception to the rule that if *A* then *B*.

Conclusion: *B* holds tentatively, but subject to withdrawal should an exception arise.

Interestingly, theorists (including theorists in favor of the eliminative view) generally characterize the structure of analogical arguments by applying SMP, which is a deductively valid form of argument. Due to the deductive validity, SMP does not allow for degrees of the narrow sense of argument strength. DMP, however, is a plausible but invalid form of argument, which allows for degrees of the narrow sense of argument strength.⁴ The introduction of DMP provides theorists

⁴ DMP surely allows for varying acceptability of the premises so that it also allows for the broad sense of argument

with an alternative: If the evaluator discerns that the arguer intends to come up with a principle with exceptions, then the evaluator should characterize the analogical argument by applying DMP.⁵ If the evaluator discerns that the arguer intends to come up with a principle without exceptions, then SMP should be applied. In this way, the principle-based argument is not necessarily deductive valid. As a result, the eliminative view allows for the degrees of argument strength (in both the narrow and broad senses).

So far, I have discussed three major defenses for the orthodox view, and elaborated on how they can be resolved from the eliminative view. This is to say that the existing defenses for the orthodox view fail to refute the eliminative view I depict. More importantly, in analyzing the dispute between the eliminative and orthodox views, I try to improve and enhance the eliminative view in the following three aspects:⁶

- 1) Pre-argument. An analogical argument without specifying the underlying principle is not a *real* argument but a *pre-argument* since the similarities between cases (i.e., the similarity proposition) have not the logical function but the epistemic function.⁷
- 2) The *dynamic* view of argument. Argument analysis is supposed to be conducted from the dynamic view of the argument so that the evaluator can get more information by dialogical interaction to discern the arguer's intention.
- 3) DMP and SMP. According to the arguer's intention discerned by the evaluator, the evaluator reconstructs the argument by applying DMP or SMP, which enables the principle-based argument to allow for degrees of argument strength.

4. A New Defense for the Orthodox View

In previous sections, I have given a critical account of the dispute between the eliminative and orthodox views and argued that the defense of the orthodox view could not tackle the challenge posed by the enhanced eliminative view. It means we need a new defense for the orthodox view if we want to rescue the distinctiveness of analogical arguments. I will try to propose a new defense for the orthodox view in what follows.

The orthodox view's difficulty is that it fails to overturn the claim that the similarities between cases can be reducible to the underlying principle. Thus, the crux of the defense for the orthodox view is to justify the irreducibility of the similarities between cases. Gamboa (2008) provides an important clue for this problem. He agrees that the eliminative view said that many so-called analogical arguments merely have "the deceptive analogical form" to be reducible to non-analogical arguments (i.e., principle-based arguments). Nevertheless, he argues that the eliminative view is not exhaustive,

strength.

⁵ According to the principle of charity, the evaluator should characterize the analogical argument by applying DMP if she tries hard and still gets into trouble in clarifying the arguer's intention.

⁶ Although what I enhanced the eliminative view can be found in previous paragraphs in this section, here I try to give an explicit account of them. This is not to say that theorists of the eliminative view never said something about these three aspects. They might say something similar subtly, while I intend to make them explicit.

⁷ Some might doubt that the idea of pre-argument here is merely begging the question, just like some say that the dispute between the eliminative and orthodox views begs the question in some sense (Bermejo-Luque 2012, pp. 3-4). In my view, the idea of pre-argument here does not beg the question because Waller has convincingly argued why the underlying principle has a theoretical advantage over the similarities between cases (I have discussed this point in the last section).

and “legitimate resemblance-based analogical inferences” (i.e., real analogical arguments) are possible (ibid., p. 234). The main idea of his argument is that in some cases, the similarities between cases cannot be eliminated and have their logical function. To elaborate the argument, he takes a biological experiment as an example, which can be briefly summarized as follows (ibid., pp. 235-238):

Animal experiments are very common in biological research. For instance, scientists usually use animal models to investigate possible effects on humans caused by external factors (e.g., environments, drugs, etc.). In a scientific study on human male reproductive fertility, scientists investigate possible effects on humans caused by environmental toxins and environmental estrogens by using animal models. Scientists inject the mice with the test substance and observe what will happen in their reproductive systems. Based on the reactions of the mice after injections, scientists can infer what will happen in human male reproductive systems under similar conditions. What argumentation theorists care about here is to ask: Why can we infer the reactions of human males from the mice? The answer seems to be easy—analogical arguments. According to the eliminative view, the analogical arguments here can be reducible to non-analogical arguments, namely statistical inductive arguments:

1. $Z\%$ of sampled mammals exposed to test substance developed fertility-related properties P.
∴ $Z\%$ of mammals exposed to test substance develop fertility-related properties P.
2. $Z\%$ of mammals exposed to test substance develop fertility-related properties P.
3. Human males are mammals.
∴ $Z\%$ of human males exposed to test substance will develop fertility-related properties P.

In doing this, the similarities between mice and human males are reducible to a principle that $Z\%$ of mammals exposed to test substance develop fertility-related properties P (i.e., premise 2). Gamboa, however, thinks that the eliminative view misinterprets the animal models in science because it captures only the common features (e.g., mammals) but ignores the differences. In the study of reproductive fertility, mice and humans have important differences in reproductive systems: the shape of sperms, the fertility levels, the weight, the efficiency of sperm production, and so on. In view of common features and differences between cases, scientists have developed a rigorous tool called “Interspecies Extrapolation Factors” (IEFs) to characterize the inference from the dose necessary to produce a toxic effect in a test animal’s reproductive system to the dose which produces the same effect in human’s reproductive system. In a few words, the common features and differences between cases need to be considered in analogical arguments in animal models. It means that the similarities proposition representing that case a is similar to case b cannot be eliminated and replaced by the underlying principle only capturing the common features between cases. In this way, Gamboa concludes that the similarities proposition does have the logical function so that the analogical arguments are a distinctive type of argument (ibid., pp. 235-241).

Is Gamboa’s argument above immune to the eliminative view? I think that Gamboa’s argument is quite inspiring because it makes important progress against the eliminative view. Unfortunately, it seems insufficient to defend against the eliminative view fully. One potential objection could be

raised as follows. The similarities proposition in Gamboa-style analogical arguments (i.e., the proposition representing the common features and differences between cases) can still be eliminated as they only stimulate the scientist to investigate the principle, such as:

“If mice exposed to test substance t have a toxic effect e on their reproductive systems, then human males exposed to test substance $f(t)$ will have the same toxic effect e on their reproductive system.”⁸

The above principle can be regarded as a less rigorous interpretation of IEFs. In this way, Gamboa-style analogical arguments can be reducible to non-analogical arguments under the eliminative view:

1. If mice exposed to test substance t have a toxic effect e on their reproductive systems, then human males exposed to test substance $f(t)$ will have the same toxic effect e on their reproductive systems.
2. Mice exposed to test substance t have a toxic effect e on their reproductive systems.
3. Therefore, man male exposed to test substance $f(t)$ will have the same toxic effect e on their reproductive systems.

Gamboa seems not to consider such a potential objection. To prevent Gamboa-style analogical arguments from eliminating the common features and differences between cases, I contend that Gamboa-style analogical arguments are, in effect, *linear* arguments containing two different arguments: conductive arguments and principle-based arguments.⁹ Principle-based arguments here refer to the above non-analogical arguments. Conductive arguments here refer to the inference to the principle, which can endow the common features and differences between cases with the logical function rather than just an epistemic one. If my contention holds, then the analogical arguments that are immune to the charge of the eliminative view will be possible.

Conductive arguments, also known as conduction or pro-con arguments, were first raised by Wellman (1971) and developed by theorists in recent years (Blair and Johnson, 2011). Conductive arguments consist of pro-reasons (PR, i.e., considerations supporting the conclusion), counter-considerations (CC, i.e., considerations undermining the conclusion), and the on-balance premise (OBP, i.e., the premise indicating positive considerations outweigh the negative considerations). PR, CC, and OBP have their own unique logical function so that conductive arguments are a distinctive type of argument. The structure of conductive arguments can be shown as follows (Hansen 2011, Zenker 2011):¹⁰

⁸ In the principle, “ t ” represents the dose of test substance for mice; “ e ” represents the degree of toxic effect; “ $f(t)$ ” represents the dose of test substance for human male, which is a function with t as the independent viable.

⁹ Shecaira (2013) suggests that analogical arguments can be viewed as complexes containing the inferences to the best explanation (IBE) and the deductive inferences. My contention here is partly inspired by Shecaira’s idea that the analogical argument could be viewed as a complex argument comprising different subarguments, but my contention is substantially different from his. I will revisit his idea later.

¹⁰ There are criticisms that CC have only the rhetorical function but not the logical one (e.g., Xie 2017), and OBE cannot be viewed as a premise in the structure of conductive arguments (e.g., Possin 2010, as cited in Hansen 2011). Although some scholars have convincingly responded to these criticisms (e.g., Hansen 2011), I will not discuss the controversy any further because this is beyond the scope of this paper.

PR: Pro-reasons 1, 2, 3...
CC: Counter-considerations 1,2,3...
OBP: PR outweigh CC
Conclusion

In Gamboa-style arguments, the inference to the principle can be characterized by conductive arguments. Specifically, the common features can be viewed as pro-reasons, the differences can be viewed as counter-considerations, and the on-balance premise can represent the weighing mechanism between them. In the case of the toxic effect on the human male's reproductive system, the structure of the conductive argument is formulated as follows:

PR: In terms of the toxic effect on the reproductive system, the relevant common features between mice and human males are germ cell development and spermatogenesis.

CC: In terms of the toxic effect on the reproductive system, the relevant differences between mice and human males are the shape of sperms and the fertility levels.

OBP: In terms of the toxic effect on the reproductive system, the relevant common features between mice and human males outweigh the relevant differences.

Conclusion: If mice exposed to test substance t have a toxic effect e on their reproductive systems, then human males exposed to test substance $f(t)$ will have the same toxic effect e on their reproductive systems.¹¹

With the structure of conductive arguments, the logical function of the similarities between cases is demonstrated in two aspects: (a) The common features support the conclusion while the differences undermine the conclusion; (b) The common features support the conclusion more than the differences undermine it. In this way, the similarities proposition cannot be eliminated and reducible to the principle, just like the eliminative view contended. Instead, the link between the similarities proposition and the principle is an inferential link, namely the conductive argument.

I have argued that Gamboa-style analogical arguments can be reconstructed as linear arguments containing conductive and principle-based arguments. Gamboa-style analogical arguments can defend against the eliminative view, so they are arguably a *distinctive type* of argument. However, it is noteworthy that Gamboa-style analogical arguments might not apply to case-to-case arguments in ethics and law that only cares the underlying principle inspired by the common features between cases (e.g., the violinist case, the steamboat case). In other words, the *interpretative power* of Gamboa-style analogical arguments seems to be very limited—only those case-to-case arguments concerning the weighing mechanism between common features and differences can be seen as analogical arguments (e.g., animal models in scientific reasoning). Interestingly, the deficiency in the interpretative power of Gamboa-style analogical arguments can be *complemented* by Shecaira-style analogical arguments (Shecaira 2013, p. 429).¹²

1. It is true that a .

¹¹ In the case of the toxic effect on the human male's reproductive system, Gamboa (2008, pp. 236-237) lists many relevant common features and differences between mice and human males, but I just mention a few of them for simplicity.

¹² It means that Gamboa-style and Shecaira-style analogical arguments are *compatible* and *complementary*.

2. The most plausible (i.e., the best) reason for believing *a* is the principle *C*.
3. Therefore, it is true that *C*.
4. *C* implies *b*.
5. Therefore, it is true that *b*.

Shecaira (2013) argues that analogical arguments in ethics and law can be regarded as complexes containing IBE (i.e., the move from 1 to 3) and deductive arguments (i.e., the move from 4 to 5). In Shecaira-style analogical arguments, the logical function of the similarities proposition can be justified by IBE.¹³ Also, the interpretative power of Shecaira-style analogical arguments is satisfactory—case-to-case arguments that are concerned about the principle behind the common features can be seen as analogical arguments. It means that those analogical arguments people are most familiar with (e.g., analogical arguments in ethics, law, and daily life) can be seen as a distinctive type of argument. This is what Shecaira’s insights contribute to the defense for the distinctiveness of analogical arguments. As I argued in the previous section, however, the arguments from principle *need not* be deductive because of the introduction of DMP. Thus, a *modified* version of Shecaira-style analogical arguments can be formulated as follows: Analogical arguments in ethics and law can be regarded as complexes containing IBE and principle-based arguments.

5. Conclusion

The main ambition of this paper is to give a critical account of the dispute between the eliminative view and the orthodox view and provide a new defense for the orthodox view. The existing defense for the orthodox view has been found to fail to resist the attack of the existing and the enhanced eliminative views. The new defense for the orthodox view can be summarized as follows. There are *two types* of analogical arguments: (a) Analogical arguments containing conductive arguments and principle-based arguments, which are concerned about the weighing mechanism between the common features and the differences (e.g., animal models in scientific reasoning); (b) Analogical arguments containing IBE and principle-based arguments, which are concerned about the underlying principle behind the common features (e.g., case-to-case arguments in ethics and law). These two types of analogical arguments are distinctive types of arguments, so the orthodox view can be well defended.

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¹³ The similarities proposition here refers to the relevant common feature between cases. The logical function of these relevant common features is to help the arguer to get the “best” principle by narrowing down the lists of potential principles. In this way, the similarities proposition cannot be eliminated and reducible to the principle, so the eliminative view does not work here.

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