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"In x Out": Reviewing the Group Bias through the Biological Perspective

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Abstract

The factors underlying to the ingroup favoritism and outgroup indifference/hostility are broadly studied by social psychology, where studies report that, for example, individuals trust more and associate positive words to members of the same group. The study of these factors can help in understand phenomena such as prejudice and ethonocentrism. However, a systematic search in the databases *Web of Science, Google Scholar*, *Scielo*, and *Lilacs* for the keywords related to group bias showed a studies shortage for this topic in Brazil. Besides, in the studies retrieved, just one fitted into evolutionary perspective and no study has approached the neuroendocrine mechanisms of the group bias. Therefore, the objective of this study was to discuss the group bias through the biological perspective, explaining the evolutionary hypothesis to the evolution of these behaviors, the methods applied to study this topic, and the neuroendocrine basis and neural substrates mediating them.

Keywords: Ingroup favoritism, game theory, neuroendocrinology, evolutionary perspective.

"*In* x *Out*": Revisando o Viés de Grupo através da Perspectiva Biológica

Resumo

Os fatores subjacentes ao favorecimento do endogrupo e de indiferença/hostilidade ao exogrupo são amplamente estudados pela psicologia social, onde estudos reportam que, por exemplo, indivíduos confiam mais e associam palavras positivas aos membros do mesmo grupo. O estudo desses fatores pode ajudar na compreensão de fenômenos tais como preconceito e etnocentrismo. As perspectivas evolucionista e neuroendócrina vêm sendo extremamente relevantes nos últimos anos para o estudo do favoritismo *ingroup*. Todavia, uma busca sistemática nas bases de dados *Lilacs*, *Scielo*, *Google Scholar* e *Web of Science* por palavras-chave relacionadas ao viés de grupo demonstrou uma carência por publicações nesse tema no Brasil. Dos trabalhos recuperados, apenas um se enquadrava na perspectiva evolucionista e nenhum abordava os mecanismos neuroendócrinos do viés de grupo. Dessa forma, o objetivo do presente estudo é discutir o viés de grupo através de uma perspectiva biológica, explicitando as hipóteses para a evolução desses comportamentos, os métodos empregados para o estudo dos mesmos e as bases neuroendócrinas e os substratos neurais que os medeiam.

Palavras-chave: Favoritismo *ingroup*, teoria dos jogos, neuroendocrinologia, perspectiva evolucionista.

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"*In* x *Out*": Revisando el Sesgo de Grupo a través de la Perspectiva Biológica

Resumen

Los factores subyacentes al favorecimiento del endogrupo y a la indiferencia/hostilidad al exogrupo son ampliamente estudiados por la psicología social, donde estudios informan, por ejemplo, que los indivíduos confian más y asocian palabras positivas a los miembros del mismo grupo. El estúdio de esos factores puede ayudar en la comprensíon de fenómenos tales como el prejuicio y el etnocentrismo. Las perspectivas evolucionista y neuroendócrina han sido extremadamente relevantes en los últimos años para el estúdio del favoritismo *ingroup*. Sin embargo, una búsqueda sistemática en las bases de datos *Lilacs*, *Scielo*, *Web of Science* y *Google Scholar* por palabras claves relacionadas al sesgo de grupo demostró una carencia de publicaciones sobre ese tema en Brasil. De los trabajos recuperados sólo uno se ajustaba a la perspectiva evolucionista y ninguno abordaba los mecanismos neuroendocrino del sesgo de grupo. De esta manera, el objetivo del presente estudio es discutir el sesgo de grupo a través de una perspectiva biológica, explicando las hipótesis para la evolución de esos comportamientos, los métodos utilizados para el estúdio de ellos, las bases neuroendocrinas y los sustratos neurales que los median.

Palabras claves: Favoritismo *ingroup*, teoría de juegos, neuroendocrinología, perspectiva evolucionista.

Behavior related to both ingroup favoritism (also known as ingroup bias) and outgroup hostility (or indifference) is widely studied in social psychology with the aim of comprehending phenomena such as prejudice and ethnocentrism (Brewer & Kramer, 1985; Hewstone, Rubin, & Willis, 2002). Although such behavior is widely researched, in Brazil, studies investigating factors that promote group bias are scarce.

We conducted a survey of monographs, master's thesis, doctoral dissertations, articles, and chapters of books published in Brazil during the last 5 years (between 2011 and May 2016) in the Google Scholar, Lilacs, Scielo and Web of Science databases for the Portuguese-language equivalents of the following keywords: *Ingroup/ Outgroup*, *Ingroup Favoritism*, *Favoring One's Own Group* and *Minimum Groups*. In the end, we selected twenty-seven papers[1], twelve of which are articles published in journals and only one of them adopts the evolutionary perspective for understanding ingroup favoritism. Furthermore, none of these papers approaches group bias from a neuroendocrine perspective that could contribute to understanding causal mechanisms. This perspective has been extremely important in recent years (for a review, see De Dreu, 2012), and a review of such findings could be highly relevant to the Brazilian literature.

In the present paper, we thus intend to examine group bias from an evolutionary perspective, taking into consideration the principal theories that seek to explain its evolution, the methods adopted and the neuroendocrine mechanisms that are modulated during situations involving intergroup conflicts.

"Us Versus Them"

Classical studies in the field of social psychology have demonstrated the fact that individuals discriminate between those who belong to their ingroup and those who do not belong (Allport, 1954; Tajfel, Billig, Bundy, & Flament, 1971). This discriminatory process promotes a phenomenon known as ingroup favoritism, which can be defined as the desire to benefit someone from the same group (Balliet, Wu, & De Dreu, 2014). Previous studies have examined the repercussions of group bias, demonstrating that individuals rely more on ingroup members when faced with a threatening situation (Voci,

[1] The references marked with an asterisk indicate the studies retrieved in the systematic search.

2006); associate positive words with their ingroup (Perdue, Dovidio, Gurtman, & Tyler, 1990); and increase donations to the ingroup in competitive situations (Rubin, Badea, & Jetten, 2014).

Since such group bias promotes favoritism (parochial altruism) with respect to ingroup individuals, it can also result in feelings of avoidance, contempt and hostility in relation to individuals from other groups (Hewstone et al., 2002). Nonetheless, Brewer (1999) argues that ingroup favoritism and outgroup contempt/indifference are independent, such behavior being exacerbated in situations involving competitiveness or scarce resources. Furthermore, accumulated evidence shows that the development of group bias is caused much more by factors that promote the ingroup than by factors that demote or threaten the outgroup (for a review, see Balliet et al., 2014).

Interestingly, studies reveal that in both natural and laboratory settings ingroup favoritism is dynamic and flexible. For example, Tajfel et al. (1971) observed that individuals chose a reward matrix that would increase profits for the ingroup when compared to the outgroup. It is notable that these individuals experienced no face-to-face contact and were not acquainted with any of the members of their group or the other group; they were simply informed that they belonged to the same group based on arbitrary criteria, such as their performance on an exam or their preference for works of a certain painter. This experiment came to be known as the minimal group paradigm, demonstrating how a characteristic can be flexible in the formation of groups. Taking advantage of the US presidential elections in 2008, Rand et al. (2009) investigated the extent to which ingroup favoritism is dynamic. Making use of an economic game, the authors observed that voters exhibited strong ingroup favoritism during the presidential primaries between democrats Barack Obama and Hillary Clinton. Nonetheless, this phenomenon disappeared after the primaries, when the groups merged during the general elections.

The ability to assess and classify a person as a "friend" or "enemy" is crucial to survival in a complex social environment (Hamlin, Wynn, & Bloom, 2007). Recent evidence shows that this ability develops early in humans. In a puppet show setting, Hamlin, Wynn and Bloom (2010) observed that 3-month-old babies spent most of their time watching a puppet that helped another puppet and the least time observing a puppet that hindered the other. Buttelmann and Böhm (2014) studied the ontogeny of group bias in 6- and 8-year-olds via a game in which such children were given the opportunity to put positive or negative pictures inside the box of their own group, the box of another group or a neutral box. 6- and 8-year-olds alike displayed ingroup favoritism in their placement of positive images. Interestingly enough, 6-year-olds placed significantly fewer negative images in the outgroup box than 8-year-olds did, suggesting that outgroup contempt becomes more evident after age 6.

The development of group bias is, however, more complex than it may appear at first glance, exhibiting an elaborate interaction between biological propensity and cultural modulation. Kinzler, Shutts, and Correll (2010) review studies that suggest that sex, age and race are categories that are promptly identified by very young children. Nonetheless, sex categorization occurs earlier (3-4 years of age) than race categorization does (4-5 years of age). This implies, on the one hand, that racial categorization requires a higher level of cognition and/or learning than sex categorization does; and, on the other, that sex categorization has greater biological significance than racial categorization does. An example would be the recognition of caregivers earlier in life and of potential mates later on. Also emphasizing the greater significance of sex categorization, Kurzban, Tooby, and Cosmides (2001) showed that by manipulating group coalitions it is possible to "erase" race categorization, but not sex categorization.

The Evolution of Ingroup Favoritism

Models applying mathematical simulations seek to explain the evolution of ingroup favoritism. Hammond and Axelrod (2006)

demonstrated, within an ethnocentric context, that favoritism towards the members of one's own group is a very powerful mechanism for promoting cooperation in the absence of long-term interactions and that it becomes more evident in hostile environments. These authors also advocate that, from an evolutionary standpoint, it could have originated from kin recognition systems.

In another mathematical simulation study, Choi and Bowles (2007) demonstrated that, separately, outgroup altruism or hostility would have been unfeasible due to the high cost to the individual. Nonetheless, groups engaging in more altruistic actions would have greater advantages when competing with groups that do not engage in such actions. Hence, the driving force in the evolution of both ingroup favoritism and indifference/contempt for outgroups would have been intergroup conflict.

Finally, favoritism toward ingroup members could have evolved due to an increasing certainty that altruistic deeds would be recompensed in the future. There is thus a greater probability of future interactions with ingroup members than with outgroup members, considering that it is heuristically advantageous to cooperate preferentially with individuals of one's own group (Kiyonari, Tanida, & Yamagishi, 2000).

Kurzban et al. (2001) argue that throughout its evolutionary history, humans have faced intergroup competition for limited sources, which necessarily resulted in the categorization of the social environment as "Us versus Them." This mechanism certainly offered adaptive advantages within the environment of evolutionary adaptaness by promoting favoritism among members of the same group and hostility toward members of other groups. The "Us versus Them" mechanism thus promotes increased group cohesion.

The theory of identity fusion seeks to explain why individuals develop a visceral sense of unity with their group and its members, making their personal and social identities functionally equivalent (Swann, Gómez, Seyle, Morale, & Huici, 2009). Furthermore, the other members of their group encourage costly prosocial behavior; and they are considered a "family" by closely tied members (Swann, Jetten, Gómez, Whitehouse, & Bastian, 2012). Interestingly, strongly united individuals are more inclined toward extreme prosocial behavior when physiological arousal is high (Gómez et al., 2011). However, what evolutionary logic could explain individuals that sacrifice themselves for a group of non-kin individuals? Swann and Buhrmester (2015) claim that, when closely bonded individuals perceive that ingroup members share a wide range of characteristics, they more frequently establish close ties with larger groups. This process could lead such individuals to be more inclined to sacrifice themselves for heterogeneous groups.

Understanding Group Bias via Game Theory

Game theory came to be widely employed to understand conflict and cooperation in different groups and scenarios, applying mathematical models in which two or more individuals make decisions that influence each other mutually and each individual's payoff depends on both her/his own strategy and the strategies of the others (Alencar & Yamamoto, 2008; Myerson, 1991). From an evolutionary standpoint, natural selection tends to maintain, in the population, the genes of "good players" (i.e. individuals that maximize profits and/or minimize losses, transforming such gains into aptness; Rand & Nowak, 2013; Smith, 1974).

The essence of economic games is in the simplicity employed, whereby an individual frequently presents a self-serving, domineering strategy that is easy to understand. Nonetheless, if the individual does not adopt such a strategy, it certainly can be inferred that he/she had a reason for not doing so, such as beliefs concerning trust and reciprocity or expectations as to the application of social rules. The principal economic games employed with the aim of understanding group bias and the possible variables modulating such behavior are presented below.

The Dictator Game

Two players participate, the first of which (the dictator) is responsible for deciding how to

split a given resource ("endowment") – which can be measured in real or hypothetical units – between him/herself and the second player (the recipient), who must accept the distribution. The dictator is free to choose to give the recipient an amount varying between the entire sum and nothing. For example, the dictator receives 10 monetary units and deals out two of them, it being up to the recipient to simply accept the apportionment. The result of the dictator game can thus be interpreted as a primary source of social preference (Everett, Faber, & Crockett, 2015). Fowler and Kam (2007) used the dictator game to verify the amount of donations that Republicans and Democrats would make. The authors observed that Democrats made significantly more donations to their own party. The same was valid for the Republicans.

The Ultimatum Game

Similar to the previous game, one player is responsible for allocating an amount of a resource to the other player, who is free to decide whether or not to accept the offer. If the decision is to reject, no one receives anything. Kubota, Li, Bar-David, Banaji and Phelps (2013) conducted research as to whether belonging to an ethnic group contributes to the frequency of rejection of unfair divisions during the ultimatum game. They observed that, regardless of the ethnic group, participants accepted more unfair divisions from white people than from black people.

The Prisoner's Dilemma

Two players have the option of cooperating or deserting. If they both cooperate, they achieve a positive result. If one of the players cooperates and the other deserts, the former gets the higher profit and the latter gets the lower profit. The most advantageous option for a single interaction would be to desert. However, in the case of repeated interactions, the individuals make their decisions based on the behavior of the other. Employing the Iterated Prisoner's Dilemma game, Yamagishi and Mifune (2009) studied the ingroup favoritism of undergraduate students. They observed that the players cooperated significantly more with those belonging to their own group than with those belonging to the other group, a behavior that was much more pronounced in men than in women, thus demonstrating that in men this mechanism favors ingroup solidarity.

The Trust Game

Two players interact, whereby player A is responsible for transferring all, part or none of the available resources to player B. If a transfer is made, that amount is multiplied by 3. Player B must then decide whether or not to pay back an amount that he/she considers appropriate. Smith (2011) employed the minimal group paradigm and observed that, while playing the trust game, players trusted ingroup members more than they trusted outgroup members.

The Public Goods Game

This game consists of multiple players who decide how many of their private tokens should be kept to themselves and how many should go into a public pot. The tokens in the pot are multiplied by a certain factor and then evenly divided among the players. Parks, Sanna, and Berel (2001) employed the public goods game and added a new twist: They informed the players as to whether or not they belonged to the same group. They observed that donations to the public pot were significantly higher when the participants were informed that the other players belonged to the same group, demonstrating a clear preference with respect to contributions to a common pool when it is shared with ingroup members.

Neuroendocrine Mechanisms Underlying Group Bias

In the field of social neuroscience, the hormone oxytocin is one of the most important chemical modulators of social behavior (MacDonald & MacDonald, 2010). This hormone is produced by the paraventricular and supraoptic nuclei of the hypothalamus and released by the posterior pituitary gland into the blood stream

(Carter, 1998). Its well-known physiological effect is the facilitation of parturition and milk ejection. Oxytocin receptors are broadly distributed among several brain areas associated with sexual and maternal behaviors, pair bonding and the ability to form emotional ties (for a review, see De Dreu & Kret, 2016).

In light of the fact that evidence in animal models had shown that oxytocin promotes social attachment and affiliation, Kosfeld, Heinrichs, Zak, Fischbacher, and Fehr (2005) hypothesized that this hormone could increase trust levels in humans during a social dilemma. The authors administered intranasal oxytocin or placebo on men participating in the trust game. They observed that players receiving oxytocin transferred many more monetary units to the other player. This shows that oxytocin is capable of modulating trust in interpersonal relationships.

With respect to group bias, De Dreu, Greer, Van Kleef, Shalvi, and Handgraaf (2011) conducted research as to whether oxytocin could modulate ethnocentrism. They administered intranasal oxytocin or placebo to Dutch people participating in an implicit association test. Those who received oxytocin associated positive words with names related to their own nationality much more quickly than those receiving placebo. The participants were also subjected to a moral dilemma involving the option of saving a group to the detriment of the life of a single individual. Compared to the placebo group, the oxytocin group displayed a lower rate of ingroup sacrifice; and this result was not due to outgroup hostility since the oxytocin treatment did not increase willingness to sacrifice outgroup members. This experiment was of great importance with respect to demonstrating that oxytocin increases ingroup favoritism.

There is also evidence showing that oxytocin modulates one's selection of allies for a potential intergroup conflict. In a study that also involved administering intranasal oxytocin and placebo in men, De Dreu, Greer, Handgraaf, Shalvi, and Van Kleef (2012) observed that oxytocin group, viewing photos of individuals, reported that those with highly threatening features would be more useful as potential allies.

Nonetheless, studies involving intranasal oxytocin and its repercussions on ingroup favoritism are highly questionable. A meta-analytic study by Nave, Camerer, and McCullough (2015) found no evidence supporting the notion that oxytocin modulates human trust and raised questions as to whether intranasal oxytocin can reach the central nervous system. It is worth emphasizing that previous studies reveal that endogenous oxytocin concentrations are modulated by economic games without the need to administer oxytocin.

In addition to oxytocin, testosterone is another hormone that is studied in order to better understand group bias. This steroid hormone is produced in men, mainly in the testes; and in women, in the adrenal glands (Nelson & Trainor, 2007). Abundant literature associates testosterone with aggressive behavior, dominance and attention to the threats (Archer, 2006).

Evidence reveals that testosterone levels are modulated during economic games. A study by Burnham (2007) showed that, while playing the ultimatum game, men with higher testosterone levels rejected unfair offers significantly more than men with lower levels did. Curiously, women that were given sublingual testosterone during the ultimatum game proposed offers that were fairer than those of women from the control group (Eisenegger, Naef, Snozzi, Heinrichs, & Fehr, 2010).

Employing the public goods game, van Honk, Montoya, Bos, van Vugt, and Terburg (2012) verified that exogenous testosterone increased the percentage of donations to the public pot. This effect of testosterone on human cooperation was more evident in participants with little prenatal exposure to testosterone (this was verified via the 2D:4D ratio).

Reimers and Diekhof (2015) recently verified the role of testosterone in ingroup favoritism involving soccer fans. During the prisoner's dilemma game, players with high testosterone levels increased their ingroup cooperation when exposed to intergroup competition. These results reveal that testosterone levels are modulated during both economic games and intergroup conflicts.

These studies demonstrate that neuroendocrine mechanisms are employed in situations involving social exchanges and ingroup favoritism, being able to aggravate or attenuate behavioral responses.

The Brain in Bias

Studies employing functional magnetic resonance imaging (fMRI) investigate the neural bases of group bias. Using the minimal group paradigm, Volz, Kessler, and von Cramon (2009) asked participants to allocate an amount of money to their own group or to the outgroup. The authors observed that individuals exhibiting strong group bias displayed higher activation in two cortical areas: the medial prefrontal cortex and the pregenual anterior cingulate cortex. The authors hypothesized that the first area is responsible for "social identity" (i.e. individuals think about positive personal attributes that make them identify with their social group, leading them to express greater ingroup favoritism). Meanwhile, the second area is responsible for integrating information between the limbic system and the prefrontal cortex and for participating in emotion regulation, thus generating the well-known "emotional coloring" and evoking positive or negative emotions. This neural circuit thus seems to facilitate an individual's ability to make positive associations with respect to the ingroup.

When individuals distinguish members of their own group from those of other groups, perceptual processes can function differently. Molenberghs, Halász, Mattingley, Vanman, and Cunnington (2013) employed a situation in which two groups competed to see which one could perform a task faster. Videos of this competition were manipulated to make the groups' times equal and were then shown to the participants while their brain activity was recorded via fMRI. The participants reported that ingroup members performed the task faster than outgroup members did and, interestingly, during this process participants exhibited greater activity in the inferior parietal lobule, a brain area that is essential for coupling information between visual representations and the motor cortex, suggesting that group bias promotes a distinct form of visual perception among members of the same group.

Studies reveal that individuals are more emphatic toward members of their own group (for a review, see De Dreu & Kret, 2016). In order to investigate the neural mechanisms underlying the empathy expressed during group bias, Hein, Silani, Preuschoff, Batson, and Singer (2010) conducted a study in which soccer fans watched other fans from the same or rival teams receiving small shocks over a period of time. Participants reported a greater propensity to share the shock time with fans from their own team, and this propensity was associated with activation of the anterior insula, a brain area related to empathy and to understanding the state of others. Surprisingly, when seeing rival fans experiencing pain, participants reported a lesser propensity to help them, and this attitude was associated with greater activation of the nucleus accumbens.

Studies have also been conducted as to which neural areas are involved in differentiated processing with respect to the faces of ingroup and outgroup individuals. For example, Cunningham et al. (2004) showed Caucasian participants short (automatic processing) and long videos (controlled processing) featuring faces of white and black people. When exposed to short videos with black faces, the participants exhibited significantly greater activation in the amygdala, a limbic system area associated with emotional processing. However, when they were exposed to long videos, this difference was significantly reduced and greater activity was observed in the prefrontal cortex, an area related to inhibition and control.

Lieberman, Hariri, Jarcho, Eisenberger, and Bookheimer (2005) observed the same activation pattern in the amygdala when they showed photos of African-Americans and Caucasian-Americans to the same races. However, this effect was reduced when race was verbally encoded, which resulted in greater activation of the ventromedial prefrontal cortex, an area that has circuits that inhibit the amygdala. These findings suggest that such categorization seems to be culturally learned and that its expression could also be culturally inhibited.

The aforementioned studies provide evidence that specific neural circuits are activated for facial recognition of ingroup individuals and differentiated perception of activities of ingroup members and areas associated with empathy.

Concluding Remarks

Ingroup favoritism and the development of such preferences is a topic that has been long studied by social psychology, ever since the pioneering studies of Allport and Tajfel et al. However, this topic has been rarely studied in Brazil, whether by social psychology, the origin of pioneering research, by evolutionary psychology (Brewer, 1999; Brewer & Kramer, 1985) or by physiological psychology and neurosciences (De Dreu & Kret, 2016; Hein et al., 2010), which have more recently approached this issue. The lack of Brazilian studies on this topic is astonishing because Brazilian society exhibits serious problems with respect to social inequality, discrimination and violence that are frequently related to prejudiced attitudes and social exclusion. We believe such issues could be better understood by employing the present theoretical approach because perception of belonging to a group is a strong tool not only for cooperation, but also for discrimination (Boyer, 2001; Cosmides, Tooby, & Kurzban, 2003).

In the study of this question, evolutionary psychology elucidates rarely investigated points concerning possible reasons for the emergence and maintenance of ingroup favoritism in the human species in terms of adaptive advantages. Although not an exclusively human characteristic, occurring also in primates, sociability in our species is mediated by cognition, a fact that favors the coordination of behavior and strategies. Throughout evolution, behavior coordination has favored not only cooperation, but also mainly the selection of preferred mates – ingroup members.

In this sense, individuals who favored their own group were more successful, which led to the emergence and development of psychological mechanisms that promote favoritism in humans, mechanisms that occur very early in human development, as previously discussed.

Nonetheless, predispositions do not predict behavior in all situations and contexts. From an evolutionary standpoint, behaviors are the product not only of the history of our species, but also of the transformative influence of the environment, both the current environment and the developmental environment. Although some groups (such as families) necessarily enjoy biological significance, most of the groups we belong to (such as political and religious groups) are socially constructed. It's up to us to recognize that such predispositions exist and to seek both the conditions in which they can promote the acceptance and respect of those who are different from us and opportunities for cooperation. We thus believe the evolutionary perspective has much to offer along these lines.

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Appendix

Table 1
Results Recovered According to Inclusion Criteria Applied Between 2011 and May 2016

Author(s)	Source	Year	Description	Keyword
Herrera	Google scholar	2015	Dissertation	*Endogrupo/exogrupo*
Luquiari	Google scholar	2013	Monograph	*Endogrupo/exogrupo*
Ferreira	Google scholar	2012	Thesis	*Endogrupo/exogrupo*
Oliveira	Google scholar	2011	Article	*Endogrupo/exogrupo*
Santos	Lilacs	2013	Article	*Endogrupo/exogrupo*
Bonomo, Souza, Menandro, & Trindade	Scielo	2011	Article	*Endogrupo/exogrupo*
Ciscon-Evangelista & Menandro	Scielo	2011	Article	*Endogrupo/exogrupo*
Oliveira	Google scholar	2015	Thesis	*Favoritismo* ingroup
Simai & Baeninger	Google scholar	2015	Book	*Favoritismo* ingroup
Modesto	Google scholar	2014	Thesis	*Favoritismo* ingroup
Peixoto & Gondim	Google scholar	2014	Article	*Favoritismo* ingroup
Amorim	Google scholar	2014	Article	*Favoritismo* ingroup
Souza	Google scholar	2014	Dissertation	*Favoritismo* ingroup
Fioravanti-Bastos, Seidl-de-Moura, & Landeira-Fernadez	Google scholar	2014	Article	*Favoritismo* ingroup
Di Castro	Google scholar	2014	Thesis	*Favoritismo* ingroup
Brasil	Google scholar	2012	Thesis	*Favoritismo* ingroup
Mourão	Google scholar	2012	Disseration	*Favoritismo* ingroup
Matos, Maia, & Maciel	Google scholar	2012	Article	*Favoritismo* ingroup
Almeida	Google scholar	2012	Thesis	*Favoritismo* ingroup
Martins	Google scholar	2015	Thesis	*Favorecimento do próprio grupo*
Batista	Google scholar	2014	Dissertation	*Favorecimento do próprio grupo*
Aquino, Gouveia, da Silva, & da Silva	Google scholar	2013	Article	*Favorecimento do próprio grupo*
Gomes	Google scholar	2015	Article	*Grupos mínimos*
Sacco	Google scholar	2015	Dissertation	*Grupos mínimos*
Maffezzolli & Prado	Google scholar	2013	Article	*Grupos mínimos*
Kirschbaum	Google scholar	2012	Article	*Grupos mínimos*
Fehlberg	Google scholar	2011	Dissertation	*Grupos mínimos*