

## Marketing Potential of D.N.A Kits for Private-Consumer Use on the American Consumer Market vs. the French Market

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### Abstract (English):

Josh Turner works for a thriving American bio-tech company, “LifeMatrix,” located in Boston. He is a successful young marketing specialist in the international division of the company. He has to design a business plan to sell DNA test kits to the French market, which is booming in spite of the legal ban. He is tasked by his boss Nicolas Guichard (originally a French immigrant from Lyon) with figuring out the best way to create marketing materials for French consumers who will be purchasing the kits outside of France (a way around national restrictions) and for making their company a top choice for ordering these kits.

### Case:

#### **“Être ou ne pas être, telle est la question ADN” (“To Be or Not to Be, That’s the DNA Question”)**

Il était presque huit heures et Josh regardait sa montre avec un regard perdu. Sa tasse de café était vide mais encore chaude. Il n’avait rien mangé car il était trop préoccupé par la réunion prévue ce matin-là. Il travaillait pour la société Biotech LifeMatrix depuis deux ans mais c’était la première fois qu’il se sentait si nerveux, confronté à une tâche d’une complexité sans pareil. On lui faisait confiance: il avait été recruté par LifeMatrix pour ses compétences exceptionnelles dans le marketing international et aussi pour ajouter ses talents à la branche francophone du secteur de ventes. Dans ce cas précis, on lui avait demandé de créer une campagne publicitaire pour attirer les Français métropolitains à la génomique récréative très populaire aux Etats-Unis.

Nicolas Guichard, son patron avait remarqué l’intérêt significatif pour la généalogie comme produit de consommation aux Etats-Unis en premier lieu, mais dans beaucoup d’autres pays du monde, y compris la France dont il était parti à 23 ans pour fonder sa compagnie à Boston. Il avait trouvé de nouveaux liens identitaires dans les terres fertiles du Bean Town avec sa chaudière de palourdes, son Bulkie Roll et sa bière Sam Adams. Grâce à sa ténacité et son esprit d’initiative inégalé, il avait fait d’une modeste compagnie, une entreprise bien établie sur le marché américain et dans plusieurs régions de France ainsi que dans quelques autres pays francophones. Il avait développé des domaines de biotechnologie pour aider les fermiers à augmenter leurs taux de production et les scientifiques à produire de meilleurs produits pharmaceutiques. Il avait aussi sous sa direction un laboratoire de recherche, des branches de marketing sur le plan international, des techniciens en serre et des ingénieurs qui construisaient de nouveaux sites. Parcours impressionnant et intimidant. Josh contemplait avec appréhension la scène lorsqu’il allait présenter sa campagne à Nicolas et aux investisseurs potentiels.

Comment conquérir le marché français étant donné que les tests sur le profilage génétique à usage privé était interdit en France? Entre 100.000 et 200.000 Français avaient commandé les tests par internet sur des sites de pays étrangers où ils étaient légalisés et avaient donc contourné l'interdiction légale sans tenir compte de l'amende de 3750 euros à payer si on était pris en flagrant délit. Cela faisait plusieurs mois que Josh avait commencé à rechercher les raisons possibles pour cette interdiction et pourquoi les Français continuaient à acheter ces kits malgré l'interdiction et les conséquences punitives.

La demande était là, sans l'ombre d'un doute. Quelles étaient les raisons de départ pour cette recherche généalogique à usage privé? Josh avait dû explorer toutes les avenues possibles. Quelles étaient les lois spécifiques qui interdisaient l'achat de kits de profilage génétique sur le marché privé en France? Pour quelles raisons les acheteurs potentiels pourraient être méfiants d'un tel achat? Quelles pouvaient être les implications éthiques, y compris pour atteinte à l'espace privé?

Son plan de marketing était de présenter pourquoi la multiplication de tests de profilage génétique à usages non-thérapeutiques avait commencé avec un succès immédiat aux Etats-Unis dans les années 1990 et de montrer comment ce marché y était devenu très compétitif. Quelles seraient les stratégies de vente à suivre pour profiter de l'engouement des Français pour ces kits afin d'établir un marché similaire en France mais à travers des commandes par leur compagnie américaine «LifeMatrix»? Pourquoi les Français choisiraient-ils leur compagnie plutôt qu'une autre située en Angleterre ou en Belgique?

Il y avait aussi les implications philosophiques d'un tel achat. La grande question des identités individuelles, privées, ou de groupe et collectives, étaient mises à l'épreuve. Quelles seraient les implications réelles de la vérité indéniable de l'ADN? Ne seraient-elles pas réductrices et caricaturales? Pourraient-elles être utilisées à des fins politiques non-démocratiques ayant un impact sur l'identité collective?

Il était clair qu'il y avait une application de plus en plus élargie de la biométrie, notamment l'empreinte génétique, pour l'identification des personnes et des choses. Josh voyait très bien une nouvelle ère historique où l'individu serait identifié selon des paramètres génétiques cristallisés autour d'une technologie hyper-sophistiquée, d'une notion de culturalisme subjective et potentiellement régressive et résultant de données biologiques incontournables. Effrayant, non? Tant de morceaux d'un puzzle qui lui rappelait étrangement le roman *1984* de George Orwell et son avertissement sur le danger de la manipulation de l'individu par l'autorité du pouvoir politique.

Comment traiter efficacement de toutes ces questions et avoir un business plan solide et adapté sur mesure aux besoins du marché français? Nicolas avait été le premier à être intrigué par les publicités constantes à la télévision américaine sur le «tourisme» génétique. Josh l'entendait encore lorsque l'idée lui était venue pour la première fois de percer le marché français en passant outre l'interdiction légale.

Nicolas s'était exclamé: «La généalogie est devenue la nouvelle coqueluche des Français! Ce n'est pas une coïncidence! Les gens ont aujourd'hui perdu un sens de direction. Puisqu'ils ne savent plus où ils vont, ils veulent savoir d'où ils viennent!». Il avait essayé alors de rappeler le fait que le profilage génétique avait principalement des fonctions médicales (comme prévenir une maladie héréditaire lors d'une grossesse) ou des fonctions de sécurité (comme identifier les criminels). Josh lui avait rétorqué que les Français bénéficiaient d'un système d'assurance de santé universelle contrairement aux Américains, ces tests étaient prescrits par les médecins seulement dans des cas de haute nécessité puisque chaque test réalisé coûtait en fin de compte à chaque citoyen. Aux Etats-Unis, ces tests dépendaient de l'offre et de la demande et selon les moyens financiers de chaque citoyen qui aurait voulu ce test comme il aurait voulu s'acheter un produit de luxe pour son anniversaire.

Selon Josh, si les tests devenaient des produits de consommation comme les autres, on courrait le risque de banaliser les concepts d'ordre sécuritaire, de mécanismes disciplinaires, de mobilité surveillée, de profilage racial. Il se souvenait d'avoir lu un article pendant ses recherches sur le site «Cosmopolis», qui analysait la notion de «Disneylandisation» du monde, d'exaltation de l'image. Il critiquait le marketing de la diversité des communautés culturelles exploitant l'obsession du regard et du jugement des autres. L'identité devenait un conte de fée dans lequel tous les personnages pouvaient s'assigner un rôle idéal. Bref, une identité-business,

«faite sur mesure». Mais que se passerait-il si ce conte de fée se transformait en cauchemar? Par exemple, recevoir une vérité personnelle qui met à nu la personne, une mise-à-nu par des inconnus qui nous révèlent un secret dont on ne soupçonnait pas l'existence. Et cela, souvent dans la solitude absolue de l'individu face à la vérité crue révélée par les tests de l'ADN.

«Les gens cherchent un retour à la pureté de leurs origines, de leurs distinctions culturelles locales et cela, mon vieux, dans un monde de plus en plus globalisé. Ne voyez-vous donc pas l'urgence de la situation?» avait rétorqué Nicolas avec irritation.

«Le monde aujourd'hui n'est pas un monde globalisé, c'est un monde déchiré entre poussées globalisantes et des pulsions identitaires!»<sup>1</sup> avait-il poursuivi. «Il y a une tension entre mobilité et ancrage! A nous de profiter de cette contradiction pour créer un produit qui sera irrésistible pour les Français : une identité faite sur mesure pour effacer leurs craintes de l'avenir! On va leur donner un port d'attache où revenir après leurs voyages, un antidote aux angoisses de la mondialisation!».

Josh sentit un frisson lui passer par le corps. Le mouvement migratoire — un facteur majeur du malaise identitaire actuel des peuples et des nations — était devenu de plus en plus associé avec la lutte contre le terrorisme, la criminalité, la corruption des régimes autoritaires, les crimes contre l'humanité et la misère du monde — surtout depuis les attentats du 11 septembre 2001 aux Etats-Unis. Cette association était affreusement réductrice et avait mené à des actes de violence et d'intolérance épouvantables dans l'actualité récente. Qu'allait-il se passer si on continuait sur cette route?

Assez de réflexions philosophiques! Il avait un plan solide dans sa mallette qu'il allait présenter à la réunion de directeurs et d'investisseurs et qui allait permettre la conquête du marché outre-Atlantique. Il avait arrêté sa voiture. Il était arrivé sur le parking de LifeMatrix. C'était à lui maintenant d'aller les convaincre. L'air froid était le premier mur à abattre.

## Teaching Notes:

**TOPIC:** French Business Language and Culture

**Common European Framework:** Language Level B1.2 - B2.1

**ACTFL Proficiency Guidelines:** Intermediate High - Advanced Low

**Time needed:** Six 50-minute class periods

## **Learning goals:**

1. To explore the complex process of today's intercultural communication in the business world and the art and challenges of sharing a divergent set of values via a different language and how this process can create strategic alliances that transcend cultural conflicts.
2. To provide students with a cross-cultural training in an international francophone business environment linked to selected business situations: e.g., the legal ramifications of writing skills, the communicative aspect in body language, specific business vocabulary (how to negotiate, sell, convince, answer complaints, etc.), and business culture in the broader context of issues in contemporary society and civilization.
3. To make students think strategically when faced with decision-making and apply their theory in concrete terms by resolving a set of issues challenging the business. To place them in the situation of the decision-maker who is faced with business issues and who has to come up with practical solutions and an effective business plan.

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<sup>1</sup> Ici, Nicolas reprend les idées du sociologue Alain Touraine.

## Exhibits:

### **A. Additional resources (DNA kit providers):**

#### 1. LifeMatrix:

- Company website: <http://www.lifematrix.com> (imaginary)
- Product Manufacturers: DNA kits are produced in Boston, U.S.A by LifeMatrix and sold by online orders to France and other francophone countries.

#### 2. Competition:

- AncestryDNA: <https://www.ancestry.com/dna/>
- 23andMe: <https://www.23andme.com/?staticrtb=true>
- FamilyTreeDNA: <https://www.familytreedna.com/>
- MyHeritage: <https://www.myheritage.com>
- HomeDNA: <https://homedna.com/>
- National Geographic Geno DNA Kit: <https://genographic.nationalgeographic.com>  
(stopped business in May 2019)
- African Ancestry: <https://africanancestry.com/home/>
- Full Genomes: <https://www.fullgenomes.com/>
- Living DNA: <https://livingdna.com/>

### **B. Margin analysis:**

#### 1. AncestryDNA:

- Price: 99\$ (plus 9.95 shipping)
- Tests: Autosomal
- Database: 15 million

#### 2. 23andMe:

- Price: 99\$ or 199\$ with health info (plus 9.95\$ shipping)
- Tests: Autosomal, Y-DNA, mtDNA, Health
- Database: 10 million

#### 3. FamilyTreeDNA:

- Price: 79\$ (plus 12.95\$ shipping)
- Tests: Autosomal (other tests sold separately)
- Database: 923,929

#### 4. MyHeritage:

- Price: 79-99\$
- Tests: Autosomal (10\$ for shipping and handling)
- Database: 2.4 million.

#### 5. HomeDNA:

- Price: 30-199\$
- Database: 2.5 million

6. National Geographic Geno DNA Kit:

- Price: Service no longer available since May 2019
- Database: 300.000

7. African Ancestry:

- Price: 299\$ each for matri- and patrilineal
- Tests: Y-DNA, mtDNA
- Database: 33.000

8. Full Genomes:


- Price: 695\$ (more in-depth tests additional)
- Tests: Autosomal, Y-DNA, mtDNA
- Database: None

9. Living DNA:

- Price: 99\$
- Tests: Autosomal, Y-DNA, mtDNA
- Database: Just getting started/ Not reported

**C. Product comparison:**

1. General comparison of the most popular DNA Kits (source: <http://comparednakits.com/>):

	
<b>Purpose</b>	Personal Ancestry
<b>Available in</b>	Worldwide
<b>Pricing</b>	\$79 or equivalent
<b>Pros and Cons</b>	<p><b>Advantages</b></p> <ul style="list-style-type: none"><li>• Largest family tree service</li><li>• Comprehensive genealogy results</li><li>• Large database of match-able users</li><li>• Cheap to buy</li><li>• Access to family tree resources</li><li>• Health testing (<i>NEW!</i>)</li></ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"><li>• Health tests are new and not much user feedback on them yet</li><li>• Complicated online system</li></ul>
<b>User reviews</b>	5,300, Avg score 3.6/5
<b>Editorial review</b>	<a href="#">MyHeritage Review</a>
<b>Editorial score</b>	98.2



<b>Purpose</b>	Health/Fitness and Ancestry
<b>Available in</b>	Most countries
<b>Pricing</b>	\$200 or equivalent
<b>Pros and Cons</b>	<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Industry veteran</li> <li>• Customers are overall content</li> <li>• Very comprehensive results</li> <li>• Very large database</li> <li>• Most diverse options</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Was disapproved by FDA for a period</li> <li>• Not the cheapest</li> <li>• A bit too versatile</li> </ul>
<b>User reviews</b>	3000, Avg Score 4/5
<b>Editorial review</b>	<a href="#">23andMe Review</a>
<b>Editorial score</b>	95.7



<b>Purpose</b>	Personal Ancestry
<b>Available in</b>	36 countries
<b>Pricing</b>	\$79 or equivalent
<b>Pros and Cons</b>	<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• One of the largest genealogical databases in the world</li> <li>• Gives accurate estimates of your ethnicity</li> <li>• Allows you to discover more connections with DNA matching</li> <li>• Build a Family Tree</li> <li>• Support your tree with documents from their immense library</li> <li>• Allows you to opt out of data storage</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Subscription packages come at a steep price</li> <li>• Not all results from DNA test included without subscription</li> <li>• Results may be more confusing than with competitors</li> </ul>
<b>User reviews</b>	8000, Avg score 3.4
<b>Editorial review</b>	<a href="#">Ancestry.com Review</a>
<b>Editorial score</b>	91.1

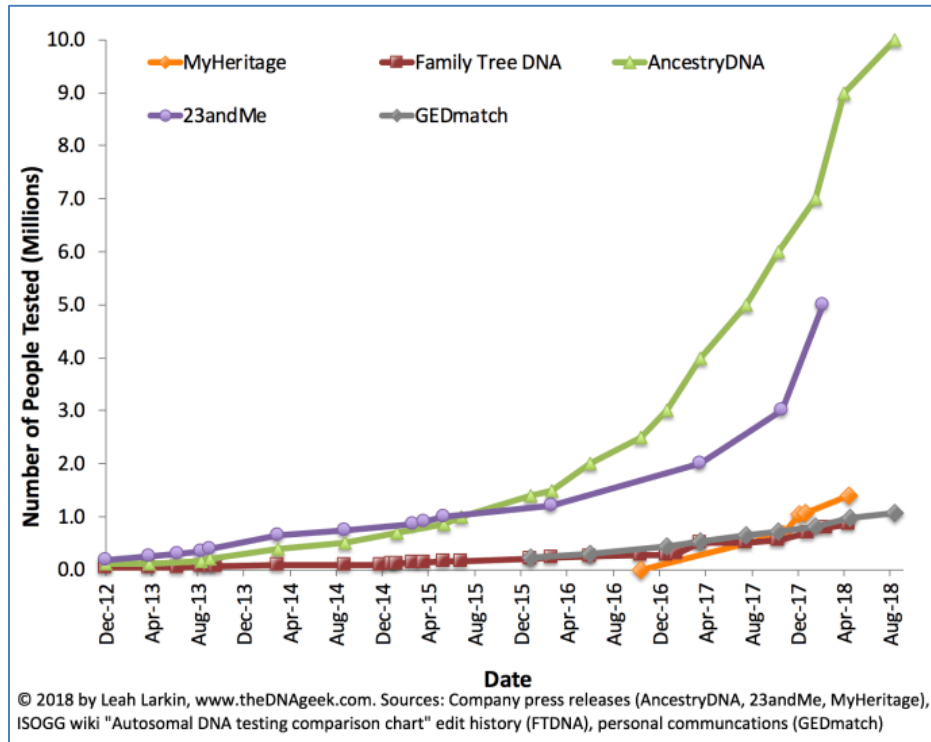


<b>Purpose</b>	Personal Ancestry and Haplotype testing
<b>Available in</b>	Worldwide
<b>Pricing</b>	\$49 to \$500
<b>Pros and Cons</b>	<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• The oldest ancestry DNA testing company</li> <li>• A large user database to compare DNA with</li> <li>• One of the most thorough haplotype testing services</li> <li>• Tests for both STRs and SNPs in various tests</li> <li>• Has some of the most advanced Y-chromosome tests available (See <i>Big Y-500</i> below)</li> <li>• The company uses its own laboratory – uncommon among DNA testing companies</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• The service does not test for health or medical information</li> <li>• The service is intended to aid a family tree project, not to build one</li> <li>• Some claim STR analysis is outdated and less accurate</li> </ul>
<b>User reviews</b>	Few reviews online
<b>Editorial review</b>	<a href="#">FamilyTreeDNA Review</a>
<b>Editorial score</b>	<b>91.1</b>



<b>Purpose</b>	Personal Ancestry
<b>Available in</b>	Worldwide
<b>Pricing</b>	\$99
<b>Pros and Cons</b>	<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Industry veteran</li> <li>• Customers are overall content</li> <li>• Very comprehensive results</li> <li>• Very large database</li> <li>• Most diverse options</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Limited user base, mostly specific for the UK</li> <li>• Smaller company</li> <li>• No information on health or medical genetic factors</li> </ul>
<b>User reviews</b>	Few reviews online
<b>Editorial review</b>	<a href="#">Living DNA Review</a>
<b>Editorial score</b>	<b>85.9</b>

2. Database Sizes — September 2018 (source: <https://thednageek.com/database-sizes-september-2018-update/>)



3. Survey data on consumer criteria (source: Brad Berman, “Best DNA Testing Kits,” *US News*, Jan. 7, 2019).

U.S. News conducted a survey of 100 consumers who used a DNA test kit to learn how they chose their kit. Here are the three factors they considered most important in the decision-making process:

What is likely to be the MOST IMPORTANT factor in your choice of a DNA test?

- It has the largest DNA database: 27.1%
- It has genetic health screening: 22.0%
- It has a strong privacy policy: 20.3%
- It has low cost: 15.1%
- It looks easy: 07.8%
- My friends/family use it: 07.6%



## Daily Lesson Plans:

### **Case Study Unit was taught by Angela Leruth in Fall 2019 with an Upper-Intermediate Class (FREN 210) at the College of William and Mary:**

Student preparation for these activities is crucial. They need to have read the material prior to each day so that they can use them in class. The material should be accessible to them in class on their computers or as printed documents. The material should also be projected on a screen in the classroom since visuals and videos are a very important component of this unit.

#### **DAY 1 (50 minutes)**

1. General introduction to the unit.
2. Start a general discussion based on a poll you fill-out with students. (*Poll included in Ancillary Material*).
3. Ask specific questions to make students reflect on key issues on the topic. (*List of questions included in Ancillary Material*).
4. Assign material to be read and prepared for next class: Ask them to read the story “To Be or Not to Be, That’s the DNA Question / Être ou ne pas être, telle est la question ADN. Ask them to gather minimal information that will help them answer some of the questions from today’s list (such as information on the ban in France, etc.).

#### **DAY 2 (50 minutes)**

1. Start with a list of questions on the story they read for today’s class. Have them work in groups on a set of different questions for each group and give them 12-15 minutes to prepare their answers. Make sure to let them know that each student in the group has to present part of the answers to the questions they have been assigned. An option that works well is to ask each group to come in front of the class to answer their set of questions. Allow about 2-3 minutes per group. It prompts a general discussion with the rest of the class when each group is presenting. (*List of questions included in Ancillary Material*)
2. Assign homework for class 4 (since it involves a long article, assign it two classes prior to the day of discussion: read the article by Marie-Hélène Parizeau (2010), « Identité, empreinte génétique et citoyenneté: réflexions philosophiques » (« Identity, DNA Typing, and Citizenship: Philosophical Reflections »).
3. For the following class 3, ask the students to think about and write a short business plan that the main character Josh Turner could present at the meeting at the end of the story. The plan will also contain a list of concerns of the potential investors that need to be addressed. That involves using facts and data (*included in “Exhibits”*).

#### **DAY 3 (50 minutes)**

1. Students work in groups to compare their business plans. They try to combine the best ideas from each plan and create a group plan to share with the class. They will explain how to address each possible concern expressed by the potential investors. This activity will start in this class and continue in class 4. As we listen to each group, the instructor will keep track of the best suggestions, which he/she will compile for the final class.

## DAY 4/5 (2 x 50 minutes)

1. Introduction to M.H Parizeau and her article. (*Summary of article included in Ancillary Material*).
2. Listening exercise on the recorded interview of M. H. Parizeau. Have a list of questions as a listening, comprehension, and thinking exercise for students. They will work in groups on assigned sets of questions on the video. These questions will also directly refer to her article. Students will have to use the article to answer some of the questions on the video. ([Video file](#) - *English subtitles included in Ancillary Material*)
3. Ask students to work on a role-play based on the story (i.e., presentation and discussion of the business plans devised by the students). Using all the information they have worked on during this case study unit, each character in the story will perform in indicated groups in front of the class when their script is ready. Start the activity with specific groups that day. Ask them to continue working on it outside of class so that they can perform for Day 6.

## DAY 6:

1. 2 minutes of warm-up before role-play performances.
2. Role-plays.

### Ancillary Material:

[Video of class interview with M. H. Parizeau](#) (with English subtitles).

### General questions to start the discussion:

1. How does the business fit into the current perspectives, values, and desires in society?
2. Is there a need for such a service to become a private consumer product on the French market? Why is it a promising or a discouraging market compared to the USA? Give general information on the health care system in each of these countries that could have an impact on the perception of the DNA kits as a consumer good.
3. What are the laws and regulations regarding DNA profiling in France and in the United States.
4. Ethics and privacy: what are key issues that arise when we consider DNA kits as a common marketable product?
5. Describe the competition among providers and how DNA profiling services differ.

### Summary of important points in the article to be discussed with the students:

Marie-Hélène Parizeau (2010), Department of Philosophy, Research Chair in Bioethics and Environmental Ethics, Université Laval, Québec, Canada. «Identité, empreinte génétique et citoyenneté: réflexions philosophiques» (Identity, DNA Typing, and Citizenship: Philosophical Reflections), un article de la revue *Sociologie et sociétés* Volume 42, Numéro 2, *Quand le vivant devient politique: les avatars de la démocratie technique*, Automne 2010, pp. 207–229.

Bioethics; the multiplication of non-therapeutic uses; and social and political applications of DNA typing, such as DNA banks for identification purposes.

Western countries, in particular European Union member states, the United States, and Canada have experienced many migratory movements in the era of globalization that have led to a questioning and possibly a restructuring of politico-social identity (Dressler, 2003) as well as an imperial logic for the US (Desbrousses et Raulet, 2003). Biometrics and genetic imprints would be used for security and identification but also could redefine individual and collective identity emphasizing an idea of «Us» vs. «Them» (i.e., foreigners, minorities,

the Other). In the article, the author analyzes genetic imprint practices in the US and in Canada and notes that by associating them with ethno-racial criteria, one creates a new Western narrative on “the Other” that excludes the concept of (multicultural) citizenship.

The article makes us reflect on what exactly «DNA» is, arguing that it is a body part rather than an image of oneself. The proof is that the extraction of a sample (such as saliva, blood, or hair) is needed to access the information on the body part, as minimal as it may be and yet so uniquely representative of a person. In this deterministic process that relies on genetic coding, an individual cannot cheat or hide a part of who they are. On the other hand, the outward physical appearance, or image, of an individual can be modified at leisure. We can color our hair, wear contact lenses, etc. DNA, by contrast, is an intrinsic, permanent component of our body. It even escapes the damage of time. The author refers to Paul Ricœur who develops the concept of “identité-mêmeté” (“identity-sameness”). The philosopher suggests that our identity as individuals cannot be reduced to a genetic sample. Our identity is instead based on a narrative.

There are very important uses of genetic profiling to determine predispositions to hereditary illnesses. These therapeutic uses include prenatal diagnosis. This can provide crucial information and have an impact on the reality of a health situation that might lead to specific decisions in view of that knowledge. In a medical context, knowledge provided in the form of probabilities and statistics is essential to making decisions about the future.

In a medical context, DNA deals with very private aspects of our identity. Individuals may feel that they are exposed and dispossessed of a very private and personal component of their identity.

The genetic profiling services for private use as a consumer product may also lead to a reductive perception of the science of genetics. The author also warns us about the impact that these tests may have on a consumer in the context of a private market — namely, a potentially very negative impact on how a person sees himself in society and as an individual.

Another example of non-therapeutic use of DNA testing available online deals with ethno-racial origins. In the USA, the African-American community has a history marked by forced migration, slavery, rape, family separation, and segregation. Contrary to the Caribbean communities of color, they never attained full political independence. Members of the African-American community are looking for their origins before enslavement and that is when DNA profiling can help. Internet services promise them the identification of their geographical area and ethnicity of origin. A few researchers on the topic worry that the exacerbation of already existing African ethnic tensions may be among the unintended implications of such genetic profiling. Of course, the results are probabilistic and may give the subjects a false (not to mention reductionist) sense of certainty or specificity of origin (and origin as identity).

In other cases, these genetic profiling services can provide contradictory results. A few Amerindian tribes from North America who agreed to participate in anthropological or biomedical research have been faced with contradictory results about their origins. This fact can modify how these tribes perceive themselves in their collective identity. (One might also think of the example of the controversy surrounding US democratic presidential candidate Elizabeth Warren’s use of DNA testing to prove her claim of Native American ancestry. For example, many critics from the Native American community argue that genetic background must not be equated with cultural identity, let alone tribal affiliation.)

In summary, DNA is not a neutral component of our body. It is not a bodily image of ourselves but a quintessential part of our personal and collective identity. Thanks to advances in technology, culturalism and biologism crystalize in a challenging way around the DNA results. This phenomenon initiates new definitions of individual and collective identity with possible political consequences, especially when ethno-racial criteria are used.

### **A few additional issues to be investigated further with the students:**

Because of the significant impact that DNA testing can have on individual and collective identities, the safeguards that are at the core of our democracies will have to be carefully analyzed and utilized to avoid regression to earlier eras of discrimination based on race, ethnicity, national origin, and religion with the tragic consequences we have witnessed in the past — regression that could progressively destroy the universalist (and pluralist) concept and practice of citizenship, as Michel Foucault, according to the Parizeau, had predicted.

### **Bibliography and Additional Background Sources:**

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